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MOTOR REFUSE COLLECTORS IN NEW YORK

Experience in the "Model District" With a New Combined Garbage, Ash and Rubbish Collector—Work Done by Each Collector and Cost of Same—Tractors Can Be Used For Snow Plows Also.

By C. L. EDHOLM.

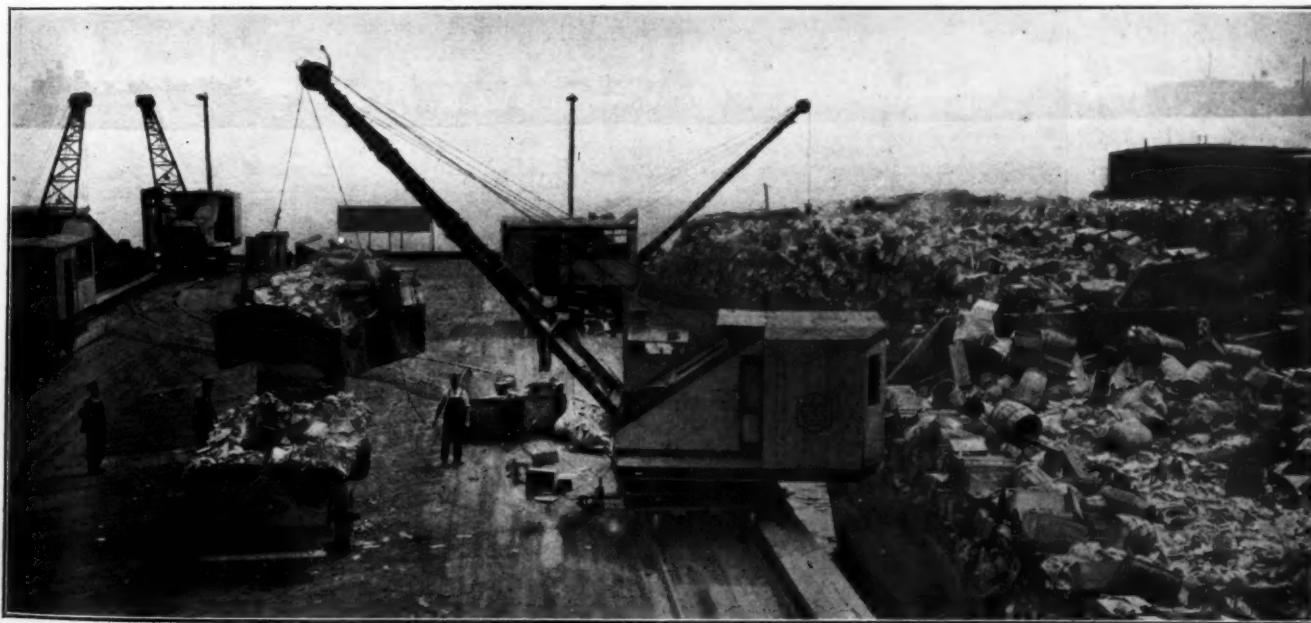
Motors are demonstrating their efficiency and economy over the horse in The Model District* of New York, where sixteen large tractors and trailers are in constant operation.

These vehicles are unique in design, having been planned by the Department of Street Cleaning for this particular purpose, and a type of rubbish and garbage collector has been produced which is the last word in scientific removal of refuse. The tractor is a gasoline-electric made by the General Vehicle Co., to which is attached a two-wheel semi-trailer with the unusual capacity of 25 cubic yards, and the loads carried run from 22 cubic yards to the maximum.

material can be piled up high on the body and as much as fifteen cubic yards may be handled at a load, while the lower tier of buckets total ten cubic yards. The weight of a load may run as high as 35,000 pounds.

The loading is accomplished rapidly by a crew of five loaders, the driver being occupied exclusively with the machine. As the tractor makes from 60 to 100 stops an hour, the driver has his time fully employed in operating the car.

Once loaded, the machine returns to the dumping dock for the Model District, at the East River and E. 19th Street, where the unloading is accomplished speedily and scientifically. The dock is equipped with four locomotive



GENERAL VIEW OF EAST NINETEENTH STREET DOCK.
Crane removing rubbish from trailer to scows at the right.

A great advantage of this trailer is that it handles three different types of refuse, which under the older system required three kinds of vehicles to carry it away, so that the ground formerly had to be covered three times to obtain the results of a single trip of the motor vehicle. Fitted into the massive frame of the trailer are eight water-tight buckets of sheet metal construction, which are intended to carry garbage and ashes; two receive the garbage and the other six carry ashes. Above these buckets are placed two large receptacles for lightweight rubbish, such as boxes, barrels and paper. This

derricks for this purpose. They operate electrically and run on steel rails, two on each side of the dock where the big refuse scows are moored.

As the tractor and trailer enters the dock, it pauses before the first of these derricks and immediately the steel arm swings over it, and a cable is let down within reach of a helper known on the dock as a "hooker-on." This man attaches the cable to the topmost rubbish container by hooks, and at a signal the derrick lifts it bodily from the machine, swings it over the scow and upturns it. The empty receptacle is set to one side and the process is repeated with the second.

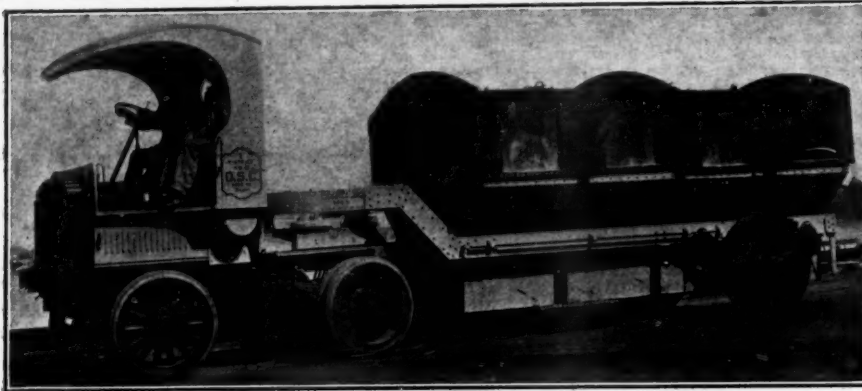
Then the tractor runs forward a few yards to another derrick and the six ash containers are picked up, one at

*A section of the city operated as a separate unit, in which new appliances and methods have been tried out and perfected before their general adoption for all the city.

a time, reversed over the scow and replaced in the trailer. The tractor is next driven to the end of the dock, makes a sharp turn and comes back to a third derrick, on the other side of the wharf. Here the garbage cans are picked up, emptied and replaced. Finally the machine returns to derrick number one, where the big, upper-deck containers are waiting, and two of these are picked up by the steel arm and set on the empty buckets. The vehicle

The cost of operating the tractors and trailers is not excessive. They make about a mile to a gallon of gasoline and repairs are handled at reasonable cost by the municipal employees. Care is taken to avoid accidents due to ignorance on the part of the drivers, by a thorough course of instruction in the mechanism of the motor.

Besides making collections, in two shifts, totalling 600 to 700 cubic yards a day, the tractors are available for



The complete vehicle, tractor and trailer combined, is shown at the left. The gasoline electric tractor supports the front end of a frame carrying eight buckets which are hung inside the frame. Supported on these buckets are two large rubbish containers. The bottoms of the containers are V-shaped, and thus permit the door over each bucket to swing in when the collector wishes to dump ashes or garbage therein. Separate buckets are used for ashes and for garbage. When not used for refuse collecting, the tractor may be used for pushing a snow plow blade in removing snow from roadways, as shown on the next page.



In the illustration on the first page, the railway crane is seen removing the rubbish containers and emptying them into a barge. The collector then moves to the next crane, where, as shown in the illustration above, the buckets are picked up and emptied onto the ash and garbage barges. The illustration at the right the bucket has been swung over a scow and is being emptied. In the former illustration is seen the "hooker on," who attaches the hoist rope to the bucket. In the last illustration a rubbish container which has been emptied is shown at the right.



is now ready to leave on another collection trip, after having been on the dock about fifteen minutes.

The cost of handling the refuse by this modern method is from 28 cents to 30 cents a cubic yard, as against a cost of 42 cent a cubic yard under the old system of horse and cart. Congestion of the streets and dock is avoided also, as the sixteen tractors replace fifty-five horse-drawn vehicles that were required formerly to keep this district clean. The cost of the tractors was \$4,166 each, while the cost of the outfit, tractor, trailer, cans, etc. was a little more than \$5,072 each. The four electric locomotive cranes, made by the Davenport Locomotive Works of Davenport, Iowa, cost \$3,000 each.

other purposes, so that the average working day of each of these machines will probably be 20 hours out of the 24. Plans have been drawn up for other apparatus to replace the refuse-collection trailers (during the hours when these are not required) by flushers, rotary brooms and squeegee cleaners. It is planned also to use the tractors equipped with snow plows for snow removal. These gasoline-electric vehicles, are admirably adapted to all of these purposes. Thus by using the trailers with buckets during the daylight hours, and replacing them with other apparatus for night work, the tractors can be kept busy nearly all the time.

Choice of the gasoline-electric type of tractor for this

service was to a great extent a matter of economy. Tests were made by the department showing that the cost of operation and maintenance for a year on three kinds of motor vehicles was as follows: electric storage batteries, \$7,296.76; lowest cost gasoline system, \$6,339.74; gasoline-electric, \$5,815.46. The fact that the last-named type generates power in excess of its own needs was another factor in making the choice, this excess power being available in the operation of flushing pumps, pick-up machines and brooms.

The detailed description of the tractors is as follows: The frame is built of amply reinforced structural shapes, carried on semi-elliptical springs. Wood bumpers, steel reinforced, protect the front and rear ends. The axles are of round alloy steel; wheels are carried on Timkin roller bearings. There are two sets of brakes, of the internal cam expanding band type; one engages drums on the rear wheels, the other drums on the intermediate gear shafts. Both are foot operated.

The motors are suspended by links from extensions of the rear spring hangers and, by extensions of their cases, bear on the rear axle. They drive by spur gears to intermediate shafts, which carry pinions engaging with internal ring gears mounted on the rear wheels. Quiet operation results from the use of pressed fabric pinions on the motor shafts.

The engine is 40 h. p., four cylinder Waukesha; $4\frac{3}{4}$ x $5\frac{3}{4}$ cylinders, cast in pairs. There is a forced lubrication system, Zenith carburetor, dual ignition system with Bosch magneto. The Rome Turney radiator has centrifugal water pump circulation. A centrifugal governor rotates at a speed of 900 r.p.m., the rated speed of the electric generator. The latter was built by the General Electric Co.; rated at 15 k.w., 125 volts, 20 amperes at 900 r.p.m. The controller, cut-out switch and ignition switch are set in a steel box beneath the driver's seat. All the electric wiring is carried in a metal conduit.

For convenience in working along the curbs, the right-hand drive was selected. The speeds are five forward and two reverse. The steering gear is of the double screw and nut type, and the arrangement of the front axle and steering knuckles allows for an unusually short turn. The wheelbase is only 72 inches, and the flexibility of the outfit is shown by the fact that the tractor and trailer, having a length of 28 feet, can turn easily in a thirty foot street. This is of considerable importance in working on the dumping dock and in the narrow side streets. The machines can attain a speed of eight miles an hour fully loaded on the level, while on a $6\frac{1}{2}$ per cent grade they are good for from three to three and a half miles an hour.

That these motor vehicles have proven economical and expeditious in the Model District would seem to demonstrate their usefulness elsewhere, as the section they serve was selected for a test because it offers a great variety of problems in street cleaning. It includes tenements, lofts, factories, mercantile establishments and private homes; in fact, it is typical of Manhattan conditions. It is irregular in shape, extending from the East river to points on Fourth, Fifth and Sixth avenues, and is bounded north and south by 42nd street and 12th street.

This is the section in which commissioner Fetherston has tried out some of his most advanced ideas and the results indicate that they are sound in respect to both economy and effectiveness.

TROLLEY CAR STREET FLUSHING*

As Practiced in Worcester, Mass.—Advantages as Compared with Sprinkling and Sweeping—Amount of Water Used—Cost.

By A. T. Rhodest†

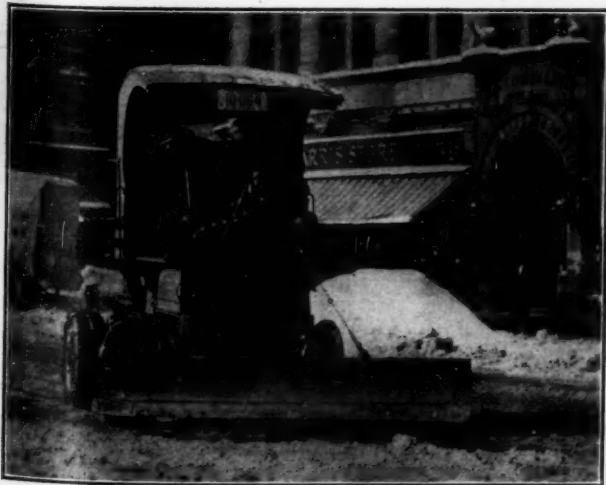
I have been asked to present a paper dealing with the new trolley car flushers in operation in the city of Worcester, Massachusetts. Worcester was the first city in the United States to adopt the cleaning of streets by flushing and also the first to use trolley car flushers, with the exception of the city of Cleveland, which developed a flusher for its own use, but which did not embody many of the features of the new trolley car flusher of the American Car Sprinkler Company. I refer particularly to the swinging arm, which enables the machine to cover an extremely wide street, the flushing at all times going in the proper direction during the swinging of the arm, outward or inward.

These trolley car flushers were constructed to meet the demands of the city of Worcester in the year 1915, when the first machine was put in operation on the streets of that city. This machine operated through the entire season with great satisfaction, together with several of the old-style car sprinklers. In fact, the operation was so satisfactory that in the year 1916 the old-style street sprinkling was abandoned entirely, and the new style of flushing has been operated on all types of permanent pavement, including grouted granite block (of which this city has the first piece in existence in the United States), sand joint block pavement, asphalt and Topeka (both with and without a concrete base), Hassam pavement (both with and without a bituminous top), wood block pavement, brick pavement, and a small section of bitulithic. There have been during the two years no noticeable defects occurring in any of these types of pavement through the operation of the flusher. The sand joint granite block pavement, which it would be expected would feel the effects to the greatest extent, we have been able to keep in a very clean and sanitary condition, being able to wash out the joints thoroughly between the blocks and cleaning the street in a manner much more satisfactory than by the old machine broom method, or any other in use previous to the adoption of this flushing system.

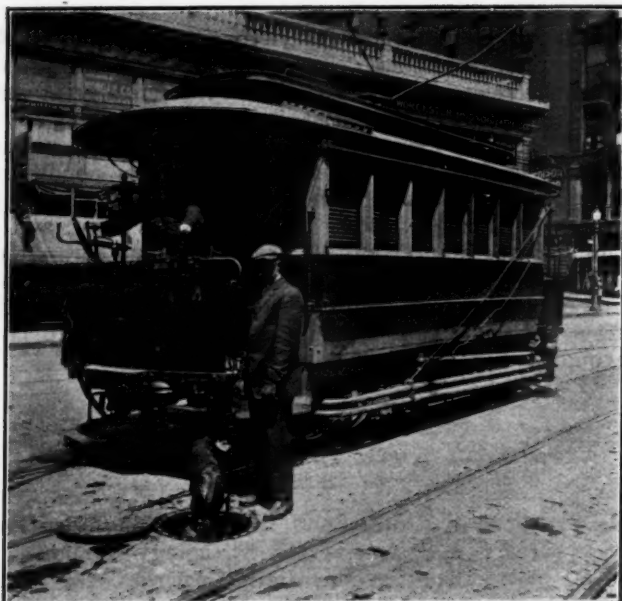
The machine used (of which the city is at present operating two) is a trolley car, containing a tank of 2,900 gallons' capacity, which is filled from hydrants constructed between the rails or tracks of the trolley system and covered by an ordinary sewer manhole cover, with an attachment for easy removal whenever removal is necessary.

*Paper read before the annual convention of the Society for Street Cleaning and Refuse Disposal at New York, October 13th, 1916.

†Street Commissioner of Worcester, Mass.



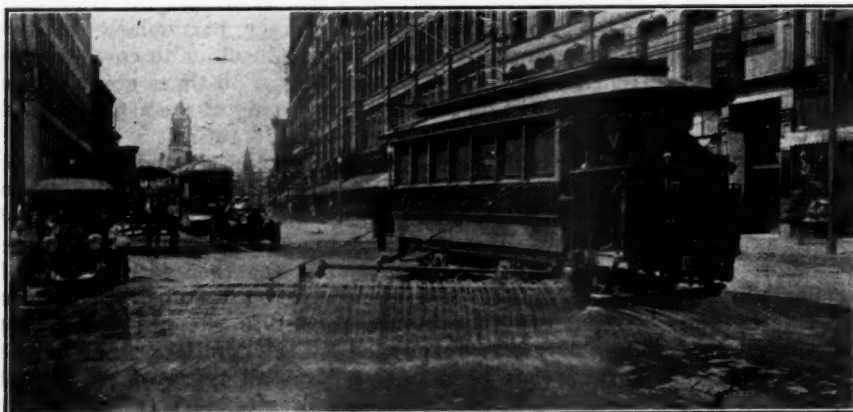
SNOW PLOW USED WITH TRACTOR THAT HAULS REFUSE TRAILER.



CAR FILLING AT FLUSH HYDRANT.

The hydrant is connected with the car by a flexible leather pipe for filling the tank in the car.

The pressure for flushing is obtained by a centrifugal pump, having a maximum capacity of from 500 to 600 gallons per minute when operated at a speed of 2,600 revolutions per minute and working under a normal work-



After making a trip of less than an hour's duration with the sprinklers in service, up one side of the street and down the other, the same car can shut off the sprinkler attachment and turn the water through the flushers and go over the same route, flushing the street just sprinkled. Or, one car can sprinkle and another car set for flushing can follow it a few minutes later.

ing pressure of 80 pounds. The pumps are equipped with a by-pass enabling the operator to cut the pressure down to as low as 30 pounds, giving a very good range to work with if a lower pressure is desired. The pump is operated

by a 45 horse-power General Electric motor. The operation of the entire machine is controlled by three men.

On the wide streets there are five nozzles working in the direction the car is traveling, three on the car and two on the swinging arms. One or the three nozzles on the car, on a double track street, catches the refuse lying upon the core of paving between the two tracks and throws it onto the opposite bound track, where it is caught on the return trip in the opposite direction and carried to the gutters.

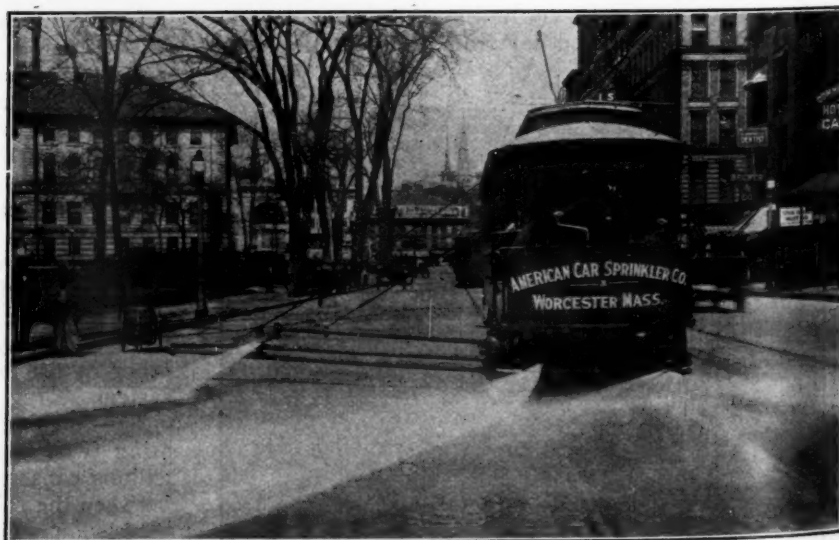
Too much cannot be said in favor of sprinkling the pavement within an hour before the time of flushing. This sprinkling softens up any deposits that are stuck down to the pavement, soaking them up and making them easy to remove by the flushing. I think that failure to do preliminary sprinkling has been one of the chief causes of failure to secure proper results from flushing with either cars or trucks.

It will readily be seen that these cars are finely equipped for this particular style of operation, because they have the sprinkling attachments, both on the car and on the swinging arm, which can be operated in advance of the flushing, the same car returning and completing the work through the flushing nozzles, if so desired.

All cars, and also the auxiliary trucks, that are operated over streets having no car tracks are equipped with Servis recorders, by the records of which we can see whether or not the car has been busy through the entire night.

Worcester covers each night 5.09 miles by tractor and 21.3 miles by car flushers. With the preliminary sprink-

The car shown in this illustration is sprinkling the street, preparatory to flushing it. It is found that if the dust is wet a short time before flushing, it adheres less firmly to the pavement and is removed more completely by the flushing water. This prior sprinkling is considered to be very important. The sprinkler and flusher arms can be adjusted to any width of roadway, or swung out of the way of vehicles or other obstacles encountered.



ling, such as we do in Worcester, a car flusher will cover about 10.5 miles of streets per night. The average length covered in eight hours by a car doing both its own sprinkling and flushing is about 9 miles, the roadway

varying from twenty-five feet to seventy-five feet in width between curbs. The truck flushers, of which we have two, in sprinkling and flushing cover each night a trifle over five miles between them and some additional flushing ahead of trolley flusher on account of trolleys having, too much and trucks too little area to cover. During the eight hours' work a car flusher will distribute approximately 95,700 gallons of water. A truck flusher will distribute approximately 43,750 gallons of water. Thus it will be seen that the trolley car flusher is apparently much more efficient in its operation than the motor truck and uses less water to the square yard in doing the work. Water for sprinkling and flushing is furnished gratis by the city. One car load of water, sprinkling a street 37 to 45 feet between curbs, will do one mile of roadway. One carload of water flushing a street 37 to 45 feet in width between curbs will cover one-quarter to one-third of a mile of roadway.

The sprinkling and flushing is done under contract with the American Car Sprinkler Co. at the following rates:

CONTRACT PRICES FOR SPRINKLING AND FLUSHING STREETS.					
Streets 25 feet wide....			Street Sprinkling	Street Flushing	
			\$396.00 per mile.	\$448.80 per mile.	
" 30	"	"	464.64	"	522.72
" 35	"	"	533.28	"	596.64
" 40	"	"	564.96	"	633.60
" 45	"	"	596.64	"	670.56
" 50	"	"	665.28	"	749.76
" 55	"	"	733.92	"	823.68
" 60	"	"	929.28	"	1,045.44
" 65	"	"	997.92	"	1,119.36
" 70	"	"	1,129.92	"	1,272.48
" 75	"	"	1,198.56	"	1,346.40
" 80	"	"	1,261.92	"	1,420.32

The company pays the street railway company for power and operates the cars with its own employes. The assessments are made against the abutters on the street flushed and sprinkled, at so much a running foot, according to the width of the street, as follows:

FRONT FOOT ASSESSMENTS FOR SPRINKLING.
Street Sprinkling Rates.

Streets 25 feet wide.....	\$0.2½ per linear foot.
" 30	.04
" 35	.04½
" 40	.04¾
" 45	.05
" 50	.05½
" 55	.06
" 60	.07½
" 65	.08
" 70	.09
" 75	.09½
" 80	.10
" 100	.11½

The company covers all streets under contract each night, except that, under the 48-hour law, the work on the down town streets is split into two 4-hour shifts for Saturday night and Sunday night, giving a 48-hour total for the week's work.

Previous to the adoption by this city of the practice of flushing at night, the streets were sprinkled under the same system during the day. Under the sprinkling system during the day, the water simply laid all the dust and other refuse which had accumulated upon the street surface right where it landed, forming a greasy, slippery scum on the surface, which was extremely dangerous to vehicular traffic, and through its slipperiness caused many accidents. It has been found that, with the flushing at night, we have been able to discontinue the sprinkling during the day, thus avoiding these very dangerous conditions and leaving a clean, dry street through working hours.

When the day sprinkling was in operation, these car sprinklers, making several trips over each street every

day, covered the same area as is now covered by two flushers, making one trip nightly for sprinkling and flushing combined, the flushers working eight hours, and the sprinklers under the old method working 14 hours.

The amount of water used under the flushing system is about 60 per cent of that used under the old-style day sprinkling, while the present combined sprinkling and flushing uses about 85 per cent of the amount.

The cost of catch basin cleaning has been just about doubled on streets which are flushed. The average cost of cleaning per catch basin per year was formerly \$1.95. On streets flushed this has been increased to \$3.90. However, there is no doubt that it has been of great benefit to the street cleaning end, a great deal of the refuse and deposits being flushed through the catch basins and into the sewer and disposed of entirely.

Previous to the installation of this system of flushing, we operated two machine broom squads at an annual cost of about \$14,000. These worked at night, covering these paved streets from two to three times per week. This work was not very satisfactory and it was also a difficult matter to keep track of labor during the night hours. This we have discontinued entirely, the only cleaning necessary being taken care of by the push-cart men, the first thing in the morning. They clean up the gutters as their first duty after reaching their stations and, owing to the fact that their street is absolutely clean of any material when they reach it, I do not believe their labors have increased or that there is any additional expense incurred on their part. The following cities have adopted the flushing system, using the American Car Sprinkler car flushers: Worcester, Malden, New Bedford, Springfield, and Somerville, Mass.; Manchester, N. H., and Syracuse, N. Y.

STREET CLEANING IN SAVANNAH*

Necessity of Stating Conditions Affecting Work in Giving Cost Data—Benefits of Cost Keeping—Methods and Costs in Savannah.

At intervals, especially during the past two or three years, considerable amounts of data have been collected and published concerning street cleaning. In one instance Municipal Journal obtained such data from 150 cities, while other cities stated that records upon this class of municipal activity had not been kept; but out of the 150 reports, only 38 gave sufficient information to permit deductions to be drawn as to the comparative cost of work in the cities noted. A man experienced in this branch of work realizes that local conditions are so varied in different municipalities that unless they are set forth in articles describing this class of work, the data contained in them are of very little value for making correct deductions.

The chief object of this paper is to show the necessity of carefully outlining the conditions which bear directly upon the cost of street cleaning work, which, in the writer's opinion, is just as important as to give the figures themselves; also the necessity of grouping together street cleaning data from those cities where the general local conditions are similar. If this is done, articles concerning street cleaning, garbage disposal, paving and other branches of municipal work, will be of much greater value, not only to experienced engineers but also to those young engineers that are just taking up municipal work and to other city officials that are adopting business-like methods for carrying on municipal work.

*Slightly condensed from a paper presented before the American Society of Municipal Improvements by E. R. Conant, chief engineer, Savannah, Georgia.

There are several benefits to be derived to compensate for the trouble and expense of keeping correct itemized costs of municipal work. In the first place, keeping such costs promotes economy and efficiency and assists materially in properly framing municipal budgets for the appropriations for the maintenance of work. Second, the proper and accurate keeping of itemized cost records of departmental work stimulates the superintendent, the foreman and others to an effort to obtain economical results, so as to make a favorable showing of their work, which results in a saving of the city's money. Third, comparing unit costs with those of work in other cities, when local conditions affecting the work are properly set forth, shows where the most efficient and economical work is being carried on and affords an opportunity for exchange of ideas among municipal engineers as to methods and types of apparatus. Fourth, but by no means of least importance, if unit cost keeping results in low cost of work done, then succeeding administrations or organi-

Asphalt block, vitrified brick and most of the granite block pavements are cleaned at night by horse-drawn sweepers, preceded by sprinklers. The sweepings are collected in piles in the gutters by use of hand brooms and scrapers and are shoveled into and removed by carts and wagons during the day. The cobble-stone pavements are hand-cleaned with brooms.

The material collected from the streets amounts to approximately twenty thousand cubic yards per year. A large proportion of the sweepings is delivered to a local concern, which pays the city the nominal amount of \$250 per year. The purchaser picks the coarser rubbish from the sweepings and grinds the remainder, adds to it a certain percentage of cotton-seed meal and potash, and sells the resulting mixture as a fertilizer, most of which is believed to be used in Florida for truck farming.

The accompanying tabulation of data accurately collected gives the cost of cleaning the above-described streets of the city:

DATA CONCERNING STREET CLEANING IN SAVANNAH, GEORGIA.

Class of Pavement.	Average width in feet, total.	Condition of Surface.	Area in Sq Yds.	Length in Miles.	Cost of Cleaning per Year, including Removal of Debris.	Cost per Mile per Year.	Cost of Cleaning per 1,000 Square Yards per Year.	Cost of Cleaning per 1,000 Square Yds. per Cleaning
Concrete	30	Good	22,000	1.25	\$480.00	\$322.00	\$22.00	\$0.204
Asphalt Block	35	Good	329,209	12.89	7,361.00	571.00	22.36	0.205
Vitrified Brick	36	{ 60% Good } { 40% Rough }	393,450	17.00	13,816.00	813.00	35.12	0.322
Granite Block	31	Fair	116,962	5.95	4,800.00	807.00	41.04	0.415
Cobble Stone	28	Rough	76,478	4.13	4,968.00	1,203.00	64.96	1.249
Sheet Asphalt	40	Good	141,319	5.04	12,226.00	2,426.00	86.52	0.277
Total			1,079,418	46.26	\$43,650.00			

zations must keep up with this record or be prepared to show the taxpayer why this is not done.

WORK IN SAVANNAH.

Conditions relative to street cleaning in Savannah are probably common to the average city of between 70,000 and 100,000 population lying below the heavy frost and snow line and with flat street grades.

In Savannah all the sewage is discharged by gravity into the Savannah river, and, as the elevation of the city ranges between 10 and 30 feet above high water, the sewer grades are very flat, and it is therefore necessary that dirt and other refuse from the streets be kept out of the sewers.

White labor exclusively is employed for street cleaning, but the force is composed of a class of men that, on account of their physical condition, are unable to do what would be classed as an ordinary day's work. Forty-eight per cent of them are over 50 years of age, and 9 per cent are over 70 years of age. The organization consists of 1 superintendent at \$110 per month, 4 foremen averaging \$2.50 per day, and 70 laborers (including cart and wagon drivers) at \$1.75 per day. The streets of Savannah are paved with sheet asphalt, asphalt block, vitrified brick, granite blocks and cobble-stones. The sheet asphalt pavements are cleaned daily, except Sundays, with scrapers, and the scrapings are placed in the gutters, from which they are promptly removed with carts. Of the area paved with asphalt block and vitrified brick, 40 per cent is cleaned twice a week, 40 per cent three times a week and 20 per cent twice a week. Of the granite block pavements, 50 per cent are cleaned twice a week, 20 per cent three times a week, and 30 per cent once a week. Cobble-stone pavements are cleaned once in about ten days.

The cost data given above include all labor involved, care of live stock, maintenance of equipment, purchase of all small implements and of other apparatus, such as sweepers, carts, etc. It also includes the cost of stock purchased to replace live stock when necessary. The city operates and maintains its own shop for repair work, horse shoeing, building carts and wagons, making repairs to harness, etc., and the proportion of shop cost is included in the costs of work as given; but these do not include interest on the investment, which, however, if added would not increase the cost by more than 1 per cent.

The tabulations show, as do correct data collected in other cities, that the cost of street cleaning is directly proportional to the roughness of the surface of the pavements. The Savannah figures indicate that the cost of cleaning concrete is the same as that of smooth asphalt block. Cleaning brick costs considerable more, as the surface of a worn brick pavement increases the difficulty of properly cleaning the same. The cleaning of granite block costs much more per unit area than a smooth type of pavement. The fact that sheet asphalt costs more for cleaning than either concrete or asphalt block is explained by the fact that it is hand-cleaned, which makes it cost more than if it were machine-cleaned. The cost of cleaning cobble-stone pavement is five times as much as that of cleaning a smooth pavement. From these figures it will be seen that, in adopting a type of pavement, the question of cost of cleaning should be considered equally as important as that of the material required for the pavement. This matter is overlooked except by those cities which have made a careful study of the situation.

The keeping of an itemized record of the cost of the various branches of the work in such a manner that the unit cost of same is always ascertainable is made the

duty of the timekeeper, in addition to that of keeping the time of all the employees of the department. This position is filled by an efficient technical graduate, who takes much interest in his duties. Unquestionably the service of this employe saves the city many times the salary paid.

The above refers to cleaning the streets provided with so-called permanent pavement; but this city, like most others, has a portion of its streets and lanes unpaved. An expenditure of \$4,500 will be made this year in cleaning the unpaved streets and lanes. The method employed is to gather up newspapers and small quantities of building material and ashes which may be thrown into the lanes, at the same time shaping up the gutters to some extent where needed. For collecting the loose paper in the business district the city has placed wooden boxes of one and two yards' capacity at various localities in the lanes. (Savannah has a regular system of lanes throughout perhaps 90 per cent of its area.) There are now about one hundred and fifty of these boxes in position, and the result has been a marked improvement in the cleanliness of the city. The boxes are emptied daily and the paper collected from the boxes is sold, the price received at present being \$3.50 a ton, unbaled.

Garbage collection will be referred to briefly. If not

attended to properly it is to some extent responsible for an unsanitary condition of the city. Perhaps in no city is the collection of garbage made more regularly than in Savannah. A daily collection is made from 80 per cent of the city, that is, in the populated section; and in the remaining 20 per cent, every third day, except that on the outskirts collection is made twice a week. The amount collected under normal conditions averages 76 tons daily. The cost of collection and delivery to the destructor plant is \$2.16 per ton.

In neither street cleaning nor garbage collecting has the city adopted motor apparatus. The writer considered this to be somewhat in the experimental stage, although data furnished in a paper before the American Society of Municipal Improvements by Mr. Miller indicated the consensus of opinion that motor-driven sweepers are more economical than horse-drawn, and that motor-driven sprinklers or flushers are without question a great improvement over horse-drawn apparatus. The writer believes however that whether it is economical to adopt motor trucks for collecting and delivering city refuse depends entirely upon local conditions, and he has not believed it expedient to advocate such for Savannah up to the present time.

STREET CLEANING DATA

Furnished by Officials in Charge of This Work in About Seventy Cities—Kinds and Numbers of Apparatus Used—Amount of Cleaning Done and Sweepings Collected—Costs.

The tables following give information from about seventy cities relative to street cleaning. The information was furnished to us, on blanks provided for the purpose, by the city engineer or official in charge of street cleaning of each of the several cities. The first table names the kinds of appliances used in each city and the number of each. The second table (in two parts) refers to hand-broom work; the third to machine-broom work; and the fourth gives the amounts of sweepings collected by the several methods. In addition there is given below the cost of cleaning in such cities as were able to furnish the information. The methods of keeping costs are not sufficiently standardized to warrant a comparison between cities, except in a most general way. These figures should, however, permit a comparison of the cost by different methods in the same city. It is interesting to learn that nearly half the cities reporting state that they are not able to furnish any cost figures.

In Table IV the figures under "Street area collected from" refer to the square yards of roadway on which sweeping is done, no area measured more than once. Those under "Sweeping done" refer to the total yardage covered by the sweeping squads during the year. The latter divided by the former would give the average number of times the streets were swept.

COST OF CLEANING.

Comparatively few of the cities reporting were able to give anything like complete and definite information concerning the cost of cleaning. The following figures give such information as we were able to obtain from the data sent in:

In Los Angeles, Cal., cleaning by patrol cost 11.6 cts. per day per thousand square yards of street; by machine broom, 10.5 cts. per thousand square yards of cleaning, and by flushing, 17.5 cts. per thousand square yards of cleaning.

In Denver, Colo., 17 cts. per 1,000 square yards of cleaning by hand squad, 16 cts. by machine broom, and 11 cts. by flushing. The cost per cubic yard of sweepings is 58 cts. by hand squad and 21½ cts. by machine broom.

In Hartford, Ct., the cost of cleaning by patrol was \$73.24 per year per thousand square yards of street, and \$35.30 by flushing. The cost per thousand square yards of cleaning done was 23.3 cts. by flushing.

In Washington, D. C., the cost per thousand square yards of street per year was \$37.14 by patrol, \$20.91 by machine broom, and \$14.70 by flushing. The cost per thousand square yards of cleaning was 13.2 cts. by patrol, 14.4 cts. by machine broom, and 21.2 cts. by flushing. The cost per cubic yard of sweepings removed was \$2.13 by patrol and \$1.49 by machine broom. The patrol men and squads are classed together and no distinction, as to amount of sweepings, is made between men working singly and those working in squads. The average quantity of dirt removed per man per day on a yearly basis amounts to 7/10 of a cubic yard per day on the hand patrol sections.

In Chicago, Ill., costs for the month of August were as follows: Per thousand square yards of street kept clean, \$3.00 by patrol; per thousand square yards of cleaning, 18 cts. by patrol, 15 cts. by horse-drawn flusher, and 8 cts. by auto flusher; cost per cubic yard of sweepings, 40 cts. by patrol; cost per thousand square yards of street for August, \$11.16 by hand squad.

Boise City, Idaho, cost per thousand square yards of cleaning, using motor sweepers, including a gutter sweeper and a pick-up wagon, 12 cts.; this including labor, operating costs, depreciation and interest on investment, disposal of sweepings, etc.

Oak Park, Ill., cost per cubic yard of sweepings by patrol, 73.2 cts.

In Sioux City, Ia., streets are flushed nightly in the business district and patrolled by day at a cost of \$4.00 per 1,000 square yards per month for patrol cleaning and same for flushing, or \$8.00 for both.

Cambridge, Mass., cost of cleaning by patrol, \$75 per year per thousand square yards of street, \$10 per thousand square yards of cleaning, and 50 cts. per cubic yard of sweepings.

(Continued on page 639.)

TABLE I.—STREET CLEANING EQUIPMENT IN SERVICE IN SEVERAL CITIES.

City.	Hand brooms.	Hand scrapers.	Machine Brooms.		Flushing Machines.		Sprinkling Wagons.		Squeegee machines.	Collecting carts or wagons.
			Horse drawn.	Motor driven.	Horse drawn.	Motor driven.	Horse drawn.	Motor driven.		
California:										
Los Angeles	300	300	..	4	..	5	50	5	..	36
Colorado:										
Denver	23	..	6	..	7	..	96	1	..	12
Connecticut:										
Hartford	46	40	..	..	4	..	26 ^a	..	2	9
District of Columbia:										
Washington	315	260	12	..	4	..	18	..	13	46
Georgia:										
Savannah	32	8	2	..	..	..	1	..	..	15
Idaho:										
Boise City .....	..	..	..	3	..	..	..	..	..	3
Illinois:										
Chicago	1,680	..	..	..	71	3	..	..	2	175
Joliet	21	..	..	..	..	..	..	..	..	3
Oak Park	14	..	1	..	..	..	1	..	..	7
Rockford .....	..	10	..	1	..	..	..	..	..	10
Indiana:										
South Bend	24	24	2	..	1	..	1	..	..	6
Iowa:										
Sioux City	20	30	..	..	2	..	2	..	..	5
Kansas:										
Wichita	10	20	..	..	3	1	2	..	..	10
Kentucky:										
Louisville .....	..	..	..	..	16	..	..	..	2	..
Louisiana:										
New Orleans	210	14	..	..	31	..	18	..	..	35 ^a
Massachusetts:										
Cambridge	50	50	6	..	1	..	15	..	1	12
Haverhill	24	..	..	..	..	..	..	..	..	3
Lawrence	60	60 ^a	2	..	1	..	16	..	..	4
Lynn	26	..	2	..	..	..	2	2	..	4
New Bedford	60	24	3	..	1	..	6	..	..	2
Newton	24	24	2	..	..	..	6	..	..	4
North Adams	7	..	1	..	1	..	4	..	..	1
Revere	4	..	2	..	..	..	2	..	..	2
Watertown	36	1	1	..	..	..	1	..	..	5
Michigan:										
Kalamazoo	3	3	2	..	..	..	..	..	..	2
Missouri:										
Sedalia	2	..	2	..	..	..	2	..	..	2
Montana:										
Butte	15	..	..	..	1	..	21	..	..	1
Nebraska:										
Lincoln	25	25	2	..	3	..	1	..	..	8
Omaha	24	..	..	..	12	..	..	..	..	6
New Hampshire:										
Concord	5	..	1	..	..	..	16	..	..	..
New Jersey:										
Newark	300	100	24	..	6	..	2	..	..	92
Passaic	40	40	1	..	..	..	3	..	..	..
Paterson	60	20	2	..	..	1	2	..	..	8
New York:										
Auburn	4	15	1	..	..	..	1	..	..	16 ^b
Binghamton	11	4	5	..	1	..	1	..	..	5 ^b
Buffalo	135	60	30	2	..	..	12	..	..	60
New York	3,000	3,000	149	..	4	..	114	..	26	2,332
Ogdensburg	2	2	1	..	1	..	1	..	..	6
Syracuse	200	200	..	..	7	..	3	..	..	23
Watervliet	6	..	1	..	..	..	1	..	..	..
North Carolina:										
Charlotte	5	..	2	..	..	..	3	..	2	2
Greensboro	4	..	1	..	1	..	2	..	..	2
Ohio:										
Akron	25	..	2	1	6	..	1	..	..	8
Columbus	70	24	10	..	2	1	9	..	..	20
Dayton	20	26	3	..	2 ^a	1	2	..	..	19
Lakewood	12	..	..	..	..	..	..	..	..	2
Toledo	34	34	4	..	4	..	1	..	..	14
Steubenville	24	24	2	..	1	..	1	..	..	4
Oregon:										
Portland	14	..	9	1	11	3	3	..	2	33
Pennsylvania:										
Allentown	41	36	..	..	3	..	..	..	..	4 ^b
Easton	9	9 ^b	..	1	1	..	1	..	..	1
Philadelphia	975	..	77	..	..	7	51	..	28	231
Wilkes-Barre .....	..	..	..	..	..	..	..	..	..	..
York .....	..	..	..	..	2	..	..	..	..	3
Rhode Island:										
Providence	96	..	3	..	..	..	1	..	..	13
South Carolina:										
Charleston	10	..	1	..	..	..	1	..	..	5
Tennessee:										
Chattanooga .....	..	..	..	..	4	..	6	..	..	20
Memphis	18	12	..	..	9	..	24	4 ^b	..	..
Nashville	32	16 ^b	..	..	2	1 ^b	36	1	..	3
Texas:										
Austin	6	6 ^b	3	..	1	..	3	..	..	12
Houston	50	..	7	2	..	..	6	1	..	9
Virginia:										
Danville	10	..	1	..	..	..	1	..	..	2
Norfolk	66	..	5	..	..	..	6	..	3	31
Washington:										
Walla Walla .....	..	..	..	..	3	..	..	..	..	..
Wisconsin:										
Fond du Lac .....	..	..	1	..	..	..	4	1	..	..
Eau Claire	4	4	1	..	..	..	10	..	..	..
Sheboygan	20	..	..	..	1	..	5	1	..	..

¹None on hard pavement; ²6 on macadam; ³every broom man carries a scraper; ⁴one is a motor truck; ⁵not in use; ⁶same as 6 in first column; ^adouble teams; ^b16 hoes used by guttermen; ^celectric driven; ^dstreet railway cars.

TABLE II-A—HAND BROOMS.

City.	Materials used.	Life of broom (days).	Effect of pavement on life.	Number of patrol men.	Number and size of squads.
California					
Los Angeles	bass	28	varies with roughness	300	
Colorado:					
Denver	bass	21	have only asphalt	28	
Connecticut					
Hartford	bass	irregular	1	40	
Washington, D. C.	bamboo	5 to 7	rough pavements decreased life	10	68 in pairs; 38 in threes
Georgia					
Savannah	rattan and fiber	6	varies with roughness	11	four of 9 men each
Illinois					
Chicago	bahia bass	8 to 21	depends on pavement	1,630	
Joliet	black African bass	20	brick worse than asphalt	21	
Oak Park	bass	14 to 28	14 days with brick	3	3 or 4 to squad
Rockford				10	
Indiana					
South Bend	African bass	..	varies with roughness	14	two of 6 men each
Iowa:					
Sioux City	wire	60	wear longest on wood block	30	
Kansas					
Wichita	bass	14	varies with roughness	10	
Kentucky					
Louisville	fiber	21	varies with roughness	23	20 to a squad
Louisiana					
New Orleans	bass	11-14	varies with roughness	52	21 to a gang
Massachusetts					
Cambridge	bass and rattan	90	life varies	36	
Haverhill	bass and bamboo	30	life varies	24	
Lawrence	bass	30	life varies	40	
Lynn	bass	18	24 days on asphalt, 12 on old block	26	
New Bedford	rattan and bass	60-70	life varies	60	three of 4 men each
Newton	rattan	20	none	17	
North Adams	bass and rattan	..	life varies	7	
Revere	rattan and bass	30	none	4	
Watertown	rattan	..		3	
Michigan					
Kalamazoo	African bass	12 to 15	last longer on asphalt	..	
Missouri:					
Sedalia	fiber and rattan	30	life varies	..	
Montana:					
Butte	fiber	10 to 16	10 days on granite	..	
Nebraska:					
Lincoln	fiber and rattan	5 wks	life varies	16	2 squads; 12 each
Omaha	bass and wire	6	life varies	18	
New Hampshire:					
Concord	rattan and bass	12	practically none	5	
New Jersey:					
Passaic	rattan	18-25	longer on asphalt	30	one squad of 10 men
Newark	rattan and bass	10		35	12 squads of 22 each
Paterson	rattan and bass	7	life varies	28	16
New York:					
Auburn	rattan	30	varies with roughness	15	
Binghamton	rattan & bass comb.	52	none	11	
Buffalo	rattan, bass & wire	10 to 15	life varies	100	
New York	bass	7-15	heavy traffic ¹ light traffic ²	27-24	6 to 8 men
Ogdensburg	rattan and fiber	60		2	
Syracuse	bass and rattan	..	40 days with brick and block	200	none
Watervliet	rattan	..	life varies	..	
North Carolina:					
Charlotte	rattan	30	none	..	
Greensboro	rattan	40	life varies	..	two squads
Ohio:					
Akron	fiber	6	life varies	..	8
Columbus	bamboo and fiber	12	6 days on brick or cobble	58	8 squads; 2 to 9 men ea.
Dayton	bass	45	less on asphalt	20	8 squads; 8 men each
Lakewood	fiber	15	life varies	..	2 squads; 6 men
Toledo	fiber	30	40 on asphalt	34	
Steubenville	rattan	..		6	9 squads of 2 men
Oregon:					
Portland	palm fiber	18	no record	14	none regular
Pennsylvania:					
Allentown	bamboo	24 on asphalt 14 on brick		41	
Easton	fiber	12		9	
Philadelphia	bass and rattan ¹	10	very little; 14 days on asphalt	565	none
York		varies	varies with roughness	22	no squads
Rhode Island:					
Providence	China reeds	..	varies with pavement	96	no squads
South Carolina:					
Charleston	bamboo & black bass	9 to 30		..	
Tennessee:					
Chattanooga	fiber	40	varies	20	none
Memphis	bass	20	varies with pavement	18	2 squads of 6 each
Nashville				10	no squads
Texas:					
Austin	bass fiber	15	life varies	6	
Houston	bass	20	longer on asphalt	14	
Virginia:					
Danville	bass and rattan	6	life varies	1	
Norfolk	bass	7		24	one of four
Wisconsin:					
Eau Claire	rattan	no record	no record	..	6 men in squad
Fond du Lac	fiber	..	wear faster on concrete	..	
Sheboygan	fiber and wire	..		..

For footnotes, see page 640.

In Kalamazoo, Mich., the cost of cleaning by machine broom was \$7.80 per month per thousand square yards of street.

In Butte, Mont., the combined patrol sweeping and flushing cost 51 cts. per thousand square yards of cleaning; by patrol, \$1.10 per cubic yard of sweepings.

Newark, N. J., uses 40 pick-up sweepers. The cost of cleaning is given as 33.05 cts. per thousand square yards

of cleaning by squad, 48.4 cts. by machine broom and 24.35 cts. by flushing.

In Passaic, N. J., by patrol, \$56.25 per year per thousand square yards of street, 28 cts. per cubic yard of sweepings.

In Paterson, N. J., by patrol, \$3.86 per month per thousand square yards of street, 58 cts. per thousand square yards of cleaning, and \$2.08 per cubic yards sweepings. By hand squad, \$1.03 per thousand square yards of street,

TABLE II-B—HAND BROOMS.

City.	Area assigned per patrolman.	Times area is machine cleaned.	Sq. yds. squad per day.	Frequency of squad cleaning.	Times area machine cleaned.	Days per yr. broom men work.
California:						
Los Angeles	27,000	3 times a week	.....	.....	.....	286
Colorado:						
Denver	13,000	daily	.....	.....	.....	310
Connecticut:						
Hartford	8,700 ^a	5½ times a wk	.....	.....	.....	282
Washington, D. C.	1,400	2 times a week	10,000 to 25,000	6 times a wk	twice a week	285
Georgia:						
Savannah	12,847	not swept	933,451	2 times a wk	twice a week	300
Illinois:						
Chicago	1,600	.....	.....	.....	.....	313
Joliet	5 blocks ^a	.....	.....	bi-weekly	.....	.....
Oak Park .....	.....	.....	.....	.....	.....	every day
Rockford .....	.....	daily	.....	.....	.....	.....
Indiana:						
South Bend	3,000 to 8,000	1 to 3 times a wk	.....	once a wk	once a week	275
Iowa:						
Sioux City	4 to 40 blocks	nightly & wkly	.....	.....	.....	9 months
Kansas:						
Wichita	5 blocks	3 times a week	.....	.....	.....	good days
Kentucky:						
Louisville	2 blocks	2 times a week	.....	.....	.....	.....
Louisiana:						
New Orleans .....	.....	daily	.....	daily	.....	313
Massachusetts:						
Cambridge	10,000	weekly	.....	.....	.....	250
Haverhill	700	.....	.....	.....	.....	250
Lawrence	9,000	.....	.....	.....	.....	.....
Lynn .....	.....	weekly	.....	daily	.....	.....
New Bedford	5,300	bi-weekly	.....	.....	.....	230
Newton	7,000 to 30,000	3 times a week	36,000	3 times a wk	once or twice yr	10-11 mos
North Adams	10,000	2 times a week	.....	.....	twice a week	200
Revere .....	.....	bi-weekly	.....	2 times a wk	bi-weekly	200
Watertown .....	.....	2 times a year	.....	.....	.....	300
Michigan:						
Kalamazoo .....	.....	.....	.....	.....	weekly	.....
Missouri:						
Sedalia	1,800	6 times a week	.....	.....	.....	250
Montana:						
Butte	7,100	weekly	.....	.....	weekly	300
Nebraska:						
Lincoln .....	.....	every 10 days	80,000	weekly	.....	216
Omaha .....	.....	daily & twice wkly	.....	.....	.....	260
New Hampshire:						
Concord	varies	.....	.....	.....	.....	.....
New Jersey:						
Newark	11,200	twice a week	97,367	3½	twice a week	275
Passaic	8,000	not done	2,400 ^a	bi-weekly	.....	9 mos.
Paterson	22,718	weekly	60,861	2 or 3 times wk	weekly	280
New York:						
Auburn	20,000	once or twice wk	.....	.....	.....	250
Binghamton .....	.....	.....	.....	.....	.....	313
Buffalo	10,400	3 to 6 times wk	.....	.....	3 times a week	245
New York	9,000	daily ^a	12,000	nightly	.....	.....
Ogdensburg	8,000	6 times a week ^a	.....	4 times a week	6 times a week ^a	313 ¹
Syracuse	8,799	3 to 6 times wk	.....	.....	.....	.....
Watervliet	3,000	3 times a week	.....	.....	twice a week	.....
North Carolina:						
Charlotte .....	.....	nightly	.....	.....	.....	365
Greensboro	20,000	3 times a week	20,000	twice daily	.....	300
Ohio:						
Akron	1,200	.....	9,600	twice a week	7 times a week	200
Columbus	8,900	1 or 2 times wk	133,300	1 to 3 times wk	1 to 3 times a week	240
Dayton	138,000	.....	213,490	once a week	4 times a week	313
Lakewood .....	.....	.....	42,000	twice a week	.....	200
Toledo	12,000	3 times a week	.....	.....	.....	every day
Steubenville .....	.....	twice a week	.....	twice a week	twice a week	200
Oregon:						
Portland	10,300	daily	.....	.....	.....	300
Pennsylvania:						
Allentown	8,000-24,000	1 or 2 times wk	.....	.....	.....	225
Easton	7,500	daily exc. Sun.	.....	.....	.....	250
Philadelphia	15,000	2 to 6 times wk	.....	.....	.....	305
York	6 squares	weekly	.....	.....	.....	300
Rhode Island:						
Providence	3,500 to 16,000	not done	.....	.....	.....	every day
South Carolina:						
Charleston .....	.....	.....	.....	2 or 3 times a wk	.....	311
Tennessee:						
Chattanooga .....	.....	daily to wkly	.....	.....	.....	.....
Memphis	2,000 to 8,000	daily	10 miles	once a week	weekly	250
Nashville	5 to 8 blocks	3 times a week	.....	twice a day ^a	.....	every day
Texas:						
Austin .....	.....	every other day	.....	twice a week	every other day	286
Houston	15,000	daily	.....	.....	.....	280-365
Virginia:						
Danville .....	.....	.....	.....	twice a week	twice a week	every day
Norfolk	15,345	1 to 6 times a wk	39,879	3 times a week	2 times a week	312
Wisconsin:						
Eau Claire .....	.....	.....	.....	.....	.....	180
Fond du Lac .....	.....	.....	.....	once a week	weekly	no record
Sheboygan .....	.....	.....	.....	.....	.....	.....

¹Nearly all sheet asphalt; ²in business streets; ³worked 10 months; ⁴worked all year; ⁵worked 7 months; ⁶of macadam; ⁷during the summer; ⁸by patrolman, not squad; ⁹6 men and 1 machine cover whole city; ¹⁰machine swept 3 times weekly and flushed 3 times weekly; ¹¹Sundays also when ordered.

¹²Bass for very fine particles. Split bamboo being used because of scarcity of bass and rattan.

96 cts. per thousand square yards of cleaning and \$2.14 per cubic yard of sweepings.

Buffalo, N. Y., by patrol, 18 cts. per thousand square yards of cleaning (13½ cts. on macadam roads), 31.8 cts. per thousand square yards of street. By machine broom, 25.1 cts. per thousand square yards of cleaning. Hand flushing with a 2-man reel costs 40.5 cts. per thousand square yards of cleaning, and by use of a portable pipeline 90 cts.

Syracuse, N. Y., by patrol, \$43 per year per thousand square yards of street kept clean; by flushing, \$21. The former is the average for all streets, flushed and unflushed, asphalt, brick and block. About one-half the total area is flushed three to six times a week.

Greensboro, N. C., by hand squad, \$4 per month per thousand square yards of street, and \$3 per month by flushing.

Akron, Ohio, by hand squad, \$3.40 per month per thou-

TABLE III.—MACHINE BROOMS.

City.	Materials used.	Area swept per filling, sq. yds.	Does dept. fill brooms?	Area cleaned per machine per day, sq. yds.	Men collecting sweepings.	Wagons collecting sweepings.	Days per years brooms work.
California:							
Los Angeles .....	.....	.....	..	150,000-200,00	...	4	daily
Colorado:							
Denver	bass and wire	25 days	yes	46 blks in 8 hrs.	drivers	12	270
Connecticut:							
Hartford .....	.....	.....	..	.....	..	..	..
District of Columbia:							
Washington	split hickory	500,000	yes	85,000 per 8 hrs.	26	12	275-280
Georgia:							
Savannah	split hickory	399,950	yes	66,675 per 9 hrs.	36	9	305
Idaho:							
Boise City .....	.....	.....	..	140,000 per 8 hrs.	..	..	..
Illinois:							
Joliet .....	.....	.....	..	.....	..	..	..
Oak Park	wire & hickory	.....	..	.....	..	..	..
Indiana:							
South Bend	bass	.....	no	.....	..	..	250
Kansas:							
Wichita	split hickory	.....	yes	.....	4	2	100
Massachusetts:							
Cambridge	rattan	1,500,000	no	75,000 per 8 hrs.	8 to 10	18	100
Lawrence	bamboo	don't know	no	don't know	14	2	1 week
Lynn	rattan	.....	no	.....	2	4	50
New Bedford	rattan	.....	yes	60,000 in 8 hrs.	12	3	...
North Adams	rattan & bass	don't know	no	.....	2	2	..
Newton	rattan & bass	2½-3 mos.	no	.....	3	2	50
Revere	rattan & bass	.....	no	.....	6	2	25
Watertown	rattan	.....	no	don't know	don't know	..	2 months
Michigan:							
Kalamazoo	hickory fiber	.....	yes	50,000 per 8 hrs.	4	2	9 months
Missouri:							
Sedalia	rattan & fiber	.....	yes	50 blocks	2	1 or 2	depends on weather
Nebraska:							
Lincoln	split hickory or bamboo	1,440,000	yes	.....	17	0	9 months
New Hampshire:							
Concord	rattan and bass	.....	..	.....	..	..	..
New Jersey:							
Newark	rattan and bass	.....	no	37,854 in 8 hrs.	4 or 5 ²	22	170
Passaic	rattan	67,200	no	9,600 per 8 hrs	2	1	125
Paterson	rattan & bass	7 days	no	don't know	10	5	45
New York:							
Auburn	fiber	no data	no	no data	2	..	..
Binghamton	hickory & bass	600,000	no	30,000 per 8 hrs.	4	2	196
Buffalo	fiber & wire	14 days	no	75,000 per 8 hrs.	55 to 60	45 to 50	225
New York	hickory	10 days	no	55,000 in 8 hrs.	..	..	8 months
Ogdensburg	wood splints	.....	no	.....	..	..	..
Watervliet	rattan	.....	no	.....	..	..	..
North Carolina:							
Charlotte	hickory fiber	25 miles	yes	4 blocks per hr.	2	2	312
Queensboro	rattan	500,000	no	5	4	2	150
Ohio:							
Akron	split hickory	660,000	yes	140,000 per 8 hrs.	6	4	200
Columbus	bass & bamboo	depends on pavement	horse brooms	17,440 per hr.	32	13	240
Dayton	wire	1,921,413	yes	213,490 per 8 hrs.	6	6	108
Toledo	wire	3,666,800	yes	70,400 per 8 hrs.	30	12	6 months
Steubenville	rattan	.....	yes	no record	8	2	200
Oregon:							
Portland	palm fiber	873,000	yes	64,200 per 8 hrs.	32	16	300
Pennsylvania:							
Easton	rattan	.....	yes	135,000	..	37 carts,	270
Philadelphia	rattan	540,000	no	90,000 in 10 hrs.	445 ¹	144 wagons	..
Rhode Island:							
Providence	split bamboo	.....	yes	25,000 in 9 hrs.	26	19	200
South Carolina:							
Charleston	split bamboo	9 days	yes	150,000 per 9 hrs.	..	..	..
Texas:							
Austin	hickory	indefinite	yes	not known	6	3	286
Houston	split hickory	800,000-900,000	yes	150,000 per 8 hrs.	24	7	280
Virginia:							
Danville	fiber	1,000,000	yes	9,000 per hr.	8	2	275
Norfolk	split bamboo	1,185,600	yes	98,800 per 9 hrs.	8	3	300
Wisconsin:							
Eau Claire	rattan	.....	no	.....	2	1 or 2	180
Fond du Lac	flat steel	no record	yes	no record	6	2	no record

¹Increased by 120 between December 15 and March 15, because of snow and ice; ²to a wagon.

sand square yards of street; by flushing, \$1.67.

Dayton, Ohio, by patrol, 8.2 cts. per thousand square yards of cleaning; by machine broom, 38 cts.; and by flushing, 22.6 cts.

Toledo, Ohio, cost by patrol, \$58.50 per year per thousand square yards kept clean.

Charleston, S. C., by machine broom (including removal of sweepings), 23.6 cts. per thousand square yards.

Norfolk, Va., by patrol, 47 cts. per cubic yard of sweepings; by machine broom, 20.56 cts. per thousand square yards of cleaning, 31 2/3 cts. per cubic yard of sweepings.

Savannah, Ga.—For these costs see article in this issue.

New Orleans, La., hand squads, 70.22 cts. per cubic yard of sweepings; by flushing, 4.75 cts. per cubic yard of sweepings, with no charge for water.

Haverhill, Mass., by patrol, \$12.30 per thousand square yards of street.

Portland, Ore., by patrol, 33.6 cts. per thousand square yards of cleaning; by machine broom, 31 cts.; by flushing, 22.9 cts.

Allentown, Pa., cleaning done by contract at the following rates: Sweeping one district (which is flushed twice a week), 34 cts. per thousand square yards; another district (flushed twice a week), 24 cts.; a district flushed once a week, 20 cts., and another district flushed once every two weeks, 16 cts. Flushing, 26 cts. per thousand square yards, regardless of frequency. During July these figures averaged as follows: By patrol, \$5.74 per thousand square yards of street kept clean; 23.9 cts. per thousand square yards of cleaning; and \$4.16 per cubic yard of sweepings. By flushing, \$1.54 per thousand square yards of street; 26 cts. per thousand square yards of cleaning.

Philadelphia, Pa., per thousand yards of cleaning done,

TABLE IV.—AMOUNT OF SWEEPINGS.

City—	Cubic yards of dirt swept daily by			Totals for the year—		
	Patrol men.	Hand brooms.	Machine brooms.	Total amount of sweepings, cu yds.	Street area collected from, sq. yds.	Sweeping done, sq. yds.
California						
Los Angeles	210	..	15	63,000	.....	900,000,000
Colorado						
Denver	12	..	144	23,490	.....	215,046,845
Connecticut						
Hartford	42	..	..	.....	330,476	93,310,000
Washington, D. C. ....	..	..	..	103,761	7,992,603	1,389,586,000
Georgia						
Savannah	20	48	..	20,400	1,074,770	107,477,000
Illinois						
Chicago	2,100	..	..	777,845	36,015,650	22,500,000 daily
Oak Park	20	..	..	11,736	.....	1,821.8 miles
Iowa						
Sioux City	65	..	..	13,000	.....	.....
Massachusetts						
Cambridge	50	..	..	10,000	.....	2,500,000
Haverhill	18	..	..	4,500	164,000	.....
New Bedford	23	..	..	5,000 ²	260,000	.....
Newton	8 to 10	8	10-12	.....	.....	1,337,600
North Adams	28 cans	..	..	.....	.....	.....
Missouri						
Sedalia .....	..	..	4	.....	.....	.....
Montana						
Butte	10	..	..	3,000	106,000	31,800,000
Nebraska						
Lincoln .....	..	14	..	.....	.....	17,280,000
New Hampshire						
Concord	12	..	..	.....	.....	.....
New Jersey						
Newark .....	..	27	..	153,806	5,406,720	661,913,338
Passaic	14	10	4	.....	.....	.....
Paterson	28	36	unknown	14,208	696,975	111,405,940
New York						
Auburn	25	25	..	6,250	281,651	.....
Buffalo	100-125	..	600	no record	.....	452,389,915 ¹
Syracuse	72	..	..	.....	.....	.....
North Carolina						
Charlotte	61-h. lds.	..	..	.....	.....	.....
Greensboro .....	..	8	25	5,000	100,000	100,000
Oregon						
Portland	5	40	..	.....	.....	.....
Ohio						
Akron .....	..	12	27	not known	1,717,670	.....
Columbus	20	..	32	14,372	.....	195,930,000
Dayton	12	..	105	26,891	2,846,921	23,100,000
Lakewood	24	24	..	2,500	.....	.....
Toledo	15 loads	..	96 loads	2,496 loads	4,392,960	.....
Steubenville .....	..	..	..	.....	5,000,000	.....
Pennsylvania						
Allentown	30 total	..	..	.....	.....	.....
Philadelphia	302	..	967	429,261	21,920,383	2,400,000,000 ²
York .....	..	..	..	4,500	120 blocks	.....
South Carolina						
Columbia .....	..	..	45	8,421	.....	.....
Tennessee						
Nashville	18	..	..	not kept separate	31 miles	no record
Texas						
Austin	20	8	20	.....	11 miles of street	.....
Houston	12	50	..	18,600	1,200,000	180,000,000
Virginia						
Danville	5	..	25	4,000	.....	21,000,000
Norfolk	44% tons	..	30% tons	22,650 tons	.....	222,390,900

¹By machine only, no record kept of patrol; ²patrol only.²For thirty-nine weeks.

15.5 cts. per patrol, 29.7 cts. by machine sweeping, 16.2 cts. by flushing. Per cubic yards of sweepings, \$3.45 by patrol, \$2.01 by machine sweeping.

Nashville, Tenn., no unit cost system is kept by street cleaning department. Street sweepings are taken up with other refuse and no separate record kept of them.

ADDITIONAL STREET CLEANING APPLIANCES.

In addition to the street cleaning appliances named in table No. 1, the following have been reported by the cities in question:

- Los Angeles, Cal.—Four vacuum sweepers.
- Denver, Colo.—One pick-up sweeper.
- Oak Park, Ill.—One pick-up sweeper.
- Lawrence, Mass.—Two trolley car sprinklers.
- New Bedford, Mass.—One pick-up sweeper, one small truck collecting sweepings.
- Butte, Mont.—A vacuum sweeper.
- Lincoln, Neb.—One pick-up sweeper.
- Newark, N. J.—Forty pick-up sweepers.
- Charlotte, N. C.—One pick-up sweeper.
- Columbus, Ohio.—One street railway car flusher.
- Houston, Texas.—Two motor trucks.
- Norfolk, Va.—One street railway sprinkler.
- Lynn, Mass.—One pick-up sweeper.

STREET CLEANING NOTES.

Los Angeles, Cal., is one of the few cities which are using vacuum sweepers. The machines used in that city, four in number, average 150,000 to 200,000 square yards per day. Each sweeper is accompanied by a wagon for removing the sweepings. These machines work every work day of the year "except when the pavement is wet."

Rockford, Ill., does very little hand sweeping; the streets are flushed every night, and city engineer Edward Main reports that they do not find it necessary to do much cleaning during the day time.

Lawrence, Mass., gives no details of cost, but states that the city spends \$35,000 per year on street cleaning.

In New Bedford, Mass., all paved streets containing car tracks are flushed nightly by car flusher, which operates eight hours and flushes an average of 185,000 square yards. For the service the city pays \$550 per month, by contract. All other streets are flushed bi-weekly with a horse-drawn flusher. Very little sprinkling for dust prevention is required on these streets.

In Kalamazoo, Mich., using machine brooms, the main streets are swept every morning except Sunday, and the other streets of the city once a week. "The policy of the city council has been to cut down the expenses to the lowest possible figure, and this is the best schedule we

can work out with the equipment and funds we have." The equipment, as shown by the table, consists of two horse-drawn machine brooms, two wagons for removing sweepings and three men with hand brooms and scrapers.

Sedalia, Mo., does not report detailed cost, but states that cleaning 50 blocks costs \$217 per month.

Concord, N. H., has very few paved streets. All the cleaning is done by patrol men with brooms and patrol carts. The sweepings are deposited in a central dumping place and removed as fast as they accumulate. A two-horse sweeping machine is used a few times during the year.

Ogdensburg, N. Y., does not use its horse-drawn machine sweeper continuously, and uses it on macadam streets only. The paved streets are flushed with a horse-drawn pressure flusher, which is followed by two men, who sweep into piles the dirt flushed into the gutters and load the same into wagons. This gang covers about 69,000 square yards of pavement a day. Two whitewings or patrol men, each with hand broom and hand scraper, care for about 10,000 square yards of pavement.

In Charlotte, N. C., all streets are cleaned by horse-drawn machine brooms outside of the fire limits. Inside these limits the area is swept each night by machine and is covered during the day by five broom men.

Columbus, O., uses fiber for machine brooms and bamboo for hand brooms. On smooth pavements a broom will last 12 days, while on brick or cobblestone it lasts

thirty. There are two machine broom gangs, each consisting of a foreman, machine broom, sprinkler, five dump carts and ten laborers with brooms. On rainy days when sweeping is impracticable the sweeper laborers are engaged in cleaning catch-basins and inlets. Split bamboo is used in the machine brooms and lasts about nine days, covering 150,000 square yards per day.

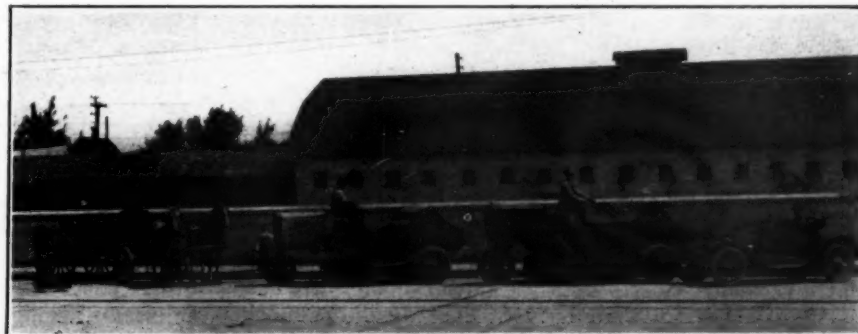
In addition to the apparatus named in the table, Memphis, Tenn., employs a gang of four men, using 500 feet of 2½-inch fire hose for flushing.

During the year 1915 the Street Cleaning Department of Nashville, Tenn., moved 128,702 cart loads of ashes and rubbish from premises and alleys, and 2,595 cart loads of garbage. Prisoners cleaned 3,439 blocks of mud, weeds and grass, and 1,666 auto trucks of this were removed. The auto trucks also removed 46 loads of snow (one truck load is equivalent to eight cart loads) and 376 cart loads. Hand-broom men swept 29,330 blocks; 11,189 blocks were flushed, using 40,806 tanks of water, or 23,075,600 gallons. During the year 1,003 sewer intakes were flushed. Street flushers cleaned 25.61 miles of paved streets. The total expenses of this work, together with the purchase of a G. M. C. 1,200-gallon electric flusher, was \$83,783.

In Norfolk, Va., 34 patrol men cover 521,751 square yards of smooth pavement, which would give an average of 15,345 square yards to each man. As a matter of fact, the areas assigned vary from 4,500 to 16,000, according to the amount of horse-drawn traffic on the street.

BOISE CITY STREET DEPARTMENT EQUIPMENT.

The illustration shows the stables and yard in the background. The equipment consists of two motor sweepers, a gutter sweeper, and a horse-drawn pick-up wagon. This force sweeps 280,000 sq. yds. per day of 8 hours at a cost of 12 cts. per 1,000 sq. yds. of sweeping done; this including labor, gasoline and oil, repairs, depreciation and interest on the investment, and disposal of the sweepings.



only about six days, before requiring refilling.

In Dayton, O., three horse-drawn machine brooms are used, accompanied by eight men, who bunch after the brooms. This gang covers the streets so swept once a week, using three days in doing so. The other three days are used by the gang of eight as hand-broom men. The downtown district, which is swept by 20 patrol men, is not machine swept, but part of it is flushed, one motor-driven flushing machine being used.

Philadelphia, Pa., uses a bass broom for "blöckmen" or patrolmen, where very fine particles of dirt are to be swept up; but for the regular street cleaning work in gangs it uses rattan. At present, however, the scarcity of both bass and rattan necessitates the use of split bamboo to a large extent. In winter, machine brooms are used to help remove snow when the fall is light; but when the snowfall is heavy or is very wet and sticks to the broom, the machine brooms are laid up and the men are used to clean street crossings or do hand broom work.

In Charleston, S. C., each patrol man, of which there are nine, carries a broom, shovel, can and can carrier, and is assigned about twelve thousand square yards. The areas so swept are those around hotels, the railroad station, market, retail stores, etc. These areas are also swept daily by machines. Two carts remove the sweepings collected by the patrol men, and also such paper and trash as accumulate in the trash cans located at the street corners, of which cans there are between twenty and

STREET CLEANING METHODS

Reports from Thirty-eight Cities Giving Methods Employed by Each—Methods Recommended for Cities of Fifteen to Fifty Thousand.

During the spring of 1916 a committee of the Chamber of Commerce of Bluefield, W. Va., wrote to various cities concerning their methods of street cleaning and garbage collection. From the reports submitted by 38 of these cities the following information has been secured through the courtesy of W. L. Shafer, secretary of the committee.

Twenty-eight of the cities reported street flushing as a regular part of the street cleaning work, while seven stated that they did not flush streets, one flushes the streets rarely, and two others (South Bend, Ind., and Huntington, W. Va.) are considering the adoption of this method. Colorado Springs, Colo.; Elgin, Ill.; Pittsburgh, Pa.; Lynchburg, Va.; Racine, Wis.; Roanoke, Va., and Savannah, Ga., do not flush their streets. The following cities flush their streets: Altoona, Pa.; Canton, O.; Charleston, W. Va.; Columbia, S. C.; Cumberland, Md.; Dayton, O.; Denver, Colo.; Detroit, Mich.; Elmira, N. Y.; Grand Rapids, Mich.; Lansing, Mich.; Lexington, Ky.; Lincoln, Neb.; Louisville, Ky.; Mansfield, Marion and Zanesville, O.; Nashville, Tenn.; Oshkosh, Wis.; Peoria, Ill.; Poughkeepsie, N. Y.; Redlands, Cal.; Richmond, Ind.; Richmond, Va.; Washington, D.

C.; Wheeling, W. Va., and Wilkes-Barre and Williamsport, Pa.

Power flushers are used in 22 of these cities in the business section and in 20 cities in the residence section. Fire hose is used in Cumberland for flushing in the business section, and in Altoona for flushing in the residence section.

Altoona flushes the business section weekly with flush wagons and the residence section once a year with hose and flush wagons. Canton uses power flushers in the business section weekly, and in the residence section as conditions require. Charleston does not state the type of flushers used or the method of flushing, but cleans the business section nightly and the residence section weekly. Colorado Springs does not clean streets in residence section. Columbia uses a 600-gallon flusher and cleans the business section daily, restricting the cleaning in the residence streets to sweeping, principally, doing this semi-weekly. Cumberland does not flush the residence section, but cleans the business district with fire hose as is necessary. Dayton uses motor flushers and cleans all streets three times a week. Detroit uses the same type of equipment, but cleans the streets twice a week. Elmira uses a Studebaker power flusher, cleaning the business streets nightly and the residence section weekly or oftener. Lansing uses the same make of machine and flushes weekly. Lexington flushes weekly and twice a week in residence streets and daily in the business districts.

Lincoln uses an Economy flusher daily and once every two weeks in the business and residence streets, respectively. Louisville flushes business streets nightly by means of 16 horse-drawn flushers and uses the same equipment in flushing the residence sections weekly. Mansfield flushes weekly and semi-weekly, using a flusher wagon equipped with a gasoline-driven pump. Business streets are flushed bi-weekly with an automatic pressure tank flusher and residence streets every six weeks in Marion. Nashville uses a 1,200-gallon electric flusher and two horse flushers, cleaning the business streets nightly and the residence streets weekly. Power flushers are used in Oshkosh, but the frequency of flushing is dependent on the weather. In Peoria all streets are cleaned nightly with washing machines. Power flushers are used in Poughkeepsie and Redlands, the former flushing business streets nightly and residence streets as needed, and the latter business streets daily and residence streets weekly. Richmond, Va., uses the St. Louis type of flushers and cleans business and residence streets daily and weekly, respectively. Rough pavements are flushed in Washington every second day in the business section and every third day in the less busy thoroughfares. Wheeling uses the St. Louis flushers semi-weekly on business streets, and as needed in other sections. Wilkes-Barre flushes nightly and weekly, while Williamsport flushes semi-weekly and weekly, using a motor-driven flusher. Zanesville uses a power flusher on the business streets only, cleaning these from one to three times a week.

A summary of these answers shows that 15 cities flush the business sections daily, 10 semi-weekly, and 4 weekly. In the residence district, 10 flush weekly, 6 every 3 days, 5 every day, 2 bi-weekly, and 1 daily. Twenty-four cities flush the business streets during the night, 3 during the morning hours, 3 either night or day and 1 during the day. On the other hand, it is the custom in 17 cities to flush residence streets during the day time, 6 require this to be done during the night, and 5 cities do not specify.

The following cities flush their business sections during the night hours: Canton, Charleston, Columbia, Cumberland, Dayton, Denver, Detroit, Elmira, Grand Rapids, Lansing, Lexington, Louisville, Nashville, Peoria, Poughkeepsie, Redlands, Richmond, Ind.; Richmond, Va.; Sa-

vannah, Washington, Wheeling, Wilkes-Barre, Williamsport, and Zanesville.

The following flush either night or day: Altoona, Huntington, and Oshkosh. Colorado Springs, Marion, and Mansfield flush in the morning, and Lincoln from 7 a. m. to 4 p. m.

Residence streets are flushed during the daylight hours in the following cities: Altoona, Canton, Charleston, Dayton, Elmira, Lansing, Lexington, Lincoln, Mansfield, Marion, Nashville, Poughkeepsie, Redlands, Richmond, Ind.; Washington, Wheeling, and Williamsport. In Denver, Peoria, Richmond, Va.; Savannah, Roanoke, and Wilkes-Barre, the work is done during the night. In Columbia, Detroit, Huntington, Louisville, and Oshkosh either day or night flushing is permitted.

Machine sweeping is the only kind of sweeping done by 17 of the cities, machine and hand sweeping by 11, hand sweeping only by 6, and 2 do not use sweepers at all, but use flushers instead. White-wings are used in 35 cities, and only two cities report not using them.

The following cities use machine brooms: Denver, Dayton, Detroit, Huntington, Ironton, Lynchburg, Marion, Oshkosh, Poughkeepsie, Savannah, Zanesville, Lexington, Lincoln, Redlands, Richmond, Ind.; Roanoke, and South Bend. Three of these cities, Lexington, Lincoln, and Richmond, Ind., use pick-up sweepers. Altoona, Colorado Springs, Columbia, Cumberland, Elgin, Grand Rapids, Mansfield, Peoria, Washington, Wilkes-Barre, and Williamsport use both hand and machine sweepers. Charleston and Elmira use flushers instead of sweepers. Canton, Harrisburg, Lansing, Louisville, Nashville, and Wheeling use hand brooms only.

White-wings are used by all the cities named except Poughkeepsie and Zanesville.

Rubbish cans are used in 29 cities, and 18 of these report them to be effective, and 2 others very effective. Four find them partly effective, 2 not very useful, and 2 others practically worthless. Four cities do not use them at all, but 3 others will soon put them in service and another has recommended their use. Altoona, Canton, Colorado Springs, Cumberland, Dayton, Denver, Detroit, Elmira, Grand Rapids, Harrisburg, Lansing, Lincoln, Marion, Peoria, Poughkeepsie, Roanoke, South Bend, Washington, Wilkes-Barre and Williamsport use rubbish cans and find them effective. Columbia, Mansfield, Oshkosh, Richmond, Savannah, and Zanesville use them, but do not find them very effective or useful. Charleston and Lynchburg also use these cans, but do not comment upon their effectiveness. Elgin, Louisville, Redlands, and Wheeling do not use them. Their use has been recommended for Richmond, Va., and Lexington.

An interesting part of the information furnished was that giving the opinions as to the best methods and equipment for use in a city of from 15,000 to 50,000 population. Altoona recommended the use of white-wings or patrols, while Cumberland was in favor of fire hose and machine and hand sweeping. Denver, Elgin, Elmira, Grand Rapids, Lansing, Mansfield, Oshkosh, Peoria, Wheeling, Wilkes-Barre and Williamsport recommend flushing and hand sweeping. Canton, motor flusher and hand sweeping; Richmond, Ind., and South Bend, flushing and sweeping; Detroit, Huntington and Zanesville, flushing. Columbia, flushing and sprinkling, with hand sweeping; Lexington, flushing and a pick-up sweeper; Lincoln, flushing with pick-up and rotary sweepers; Marion, flushing with motor-driven machines. Redlands, flusher or vacuum sweeper. Harrisburg and Washington recommend hand sweeping, the latter favoring also an occasional washing of the streets. Poughkeepsie favors an auto pick-up sweeper; Roanoke and Elgin, motor sweeper, and Racine, machine and hand sweeping.

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Municipal Journal's Information Bureau, developed by twenty-one years' research and practical experience in its special field, is at the command of our subscribers at all times and without charge.

MACHINERY IN STREET CLEANING.

"If that machine were on the pay-roll, I would certainly raise its salary," said a contractor recently concerning a machine used by him. Another contractor, referring to a machine which he was using in connection with laying large water-mains (and which we expect to describe in a few weeks), said that it seemed to be almost human and able to do everything but talk; and if "money talks," the amount which this machine was making for its owner might be considered as a most satisfactory substitute for speech.

For the last year or two contractors and others who are engaged in work where day-labor is the most important item, have had the scarcity of such labor impressed upon them most seriously and sometimes disastrously. Not only have wages risen 50 to 100 per cent, but it is absolutely impossible to obtain a sufficient number of men to carry on all the work that would otherwise have been prosecuted. While the immediate effect of this seems to be unfortunate, it is possible that it may in the end prove to be most advantageous if it leads contractors and officials who employ large numbers of men, such as superintendents of street cleaning, to foster and secure the development of machinery which will to a large extent take the place of day-labor. Every year sees placed upon the market more and better machinery for various purposes, street cleaning among them; and it is to be expected that the present stringency in the labor market will have the natural effect of still further stimulating inventors toward meeting requirements in this direction.

No machines are fool-proof, however, and the necessity for using brains in connection with them is not confined to the operating of the machine, but must be employed in selecting it also. As an illustration of this, we might refer to the opinion expressed in two articles

in this issue that the street flushing machine is an admirable substitute for hand cleaning or the machine broom, but that one of the writers is convinced that its use is not desirable in his city, because of the fact that the flat topography necessitates very light sewer grades and consequently that it is exceedingly desirable not to admit to the sewers the dirt which might be washed into them in connection with street flushing. There probably is not one of the existing machines used in connection with street cleaning of which it cannot be said that its use under some conditions is most advantageous, but under others is not to be recommended.

This failure to distinguish between the conditions under which each machine works most and least favorably has a tendency to retard adoption of the machines, since many fail to recognize the fact that the objectionable features developed in using the machine under unfavorable conditions are due to the fault, not of the machine, but of the official who is using it. It therefore seems to us that it would be to the advantage of manufacturers and promoters of such machines to make a careful, thorough and scientific study, not only of the machines themselves, but of the conditions under which they work to best advantage, and encourage their use under these conditions only.

STREET CLEANING UNITS.

The preparing of the question sheet by which were obtained the replies that formed the basis of the street cleaning information given in this issue has further impressed upon us the desirability of standardized expressions with clearly defined meanings for designating the various operations of street cleaning departments.

A certain area of street surface has to be kept clean. In cleaning it, the force passes over it a number of times in a week or year, and the amount of cleaning done in keeping this area clean is therefore several times the area itself. How shall we designate the area, and how the amount of cleaning done? In the questions sent out we called the former the "area kept clean," and the latter the "area of cleaning done." We thought this would be self-explanatory, but it was not, and two or three said they could not see any difference between the two expressions. We can, however, think of no more definite ones, and suggest that these be generally adopted to designate, respectively, the actual area as it exists in reality, and the total amount of cleaning done on this area; the quotient of the latter by the former being the average number of times the area is cleaned.

Other terms also need defining. Does "street cleaning by white wings" include the removal of the sweepings to the dump or other point of disposal? Is such removal included in machine sweeping or in flushing? We suggest the standardizing of these terms as an important duty of the newly formed organization of street cleaning officials.

STREET CLEANING AND REFUSE DISPOSAL SOCIETY.

The organization of this society about a year ago was announced by Municipal Journal, and its aims and the advantages that it should offer to street cleaning officials were commented upon. Its first annual convention was held about six weeks ago. As its finances do not yet permit it to publish its proceedings and the papers read at its convention, we have given space in Municipal Journal for this purpose, and two pages of the fourth issue of each month will be set aside for this purpose. The business proceedings of the convention are given this week; also one of the papers, entitled "Trolley Car Street Flushing," is published as one of the regular articles of this issue.

SOCIETY FOR STREET CLEANING AND REFUSE DISPOSAL OF THE UNITED STATES AND CANADA

OFFICERS OF THE SOCIETY.

J. T. Fetherston, President.

Joseph R. Buchanan, Secretary-Treas.

Executive Committee: J. T. Fetherston, G. B. Wilson, Gus H. Hanna, John F. O'Toole, A. W. Miller, Albert T. Rhodes, Joseph J. Norton, J. E. Nantel, William F. Schwartz.

General Offices: Municipal Building, New York City.

The matter appearing in this department, in the issue of the fourth week of each month, is supplied by the Publication Committee of the Society for Street Cleaning and Refuse Disposal of the United States and Canada.

MISSION OF THE SOCIETY.

The Society for Street Cleaning and Refuse Disposal of the United States and Canada aims to guide the thought and concentrate the effort to secure better conditions in street cleaning and refuse disposal methods. Through its conventions and publications the experience of each member is made to serve all members. Many will be saved the time and expense of experimenting with what others have tried and discarded. At the exhibitions, held in conjunction with the annual conventions, tests of apparatus are made by committees of experts, whose reports are available to all members of the Society. Thus will the worthy be separated from the worthless and large sums now unavoidably wasted by municipalities, in costly isolated experimenting, be saved.

CONVENTION OF 1916.

CONDENSED REPORT OF PROCEEDINGS.

The second annual convention of the Society for Street Cleaning and Refuse Disposal of the United States and Canada was called to order in the assembly room of the Department of Street Cleaning building, 140 West Twentieth street, New York City, at 10:30 a. m., Friday, October 13, 1916, President J. T. Fetherston in the chair.

Address of Welcome.

Hon. Nelson P. Lewis, chief engineer of the New York Board of Estimate and Apportionment, was introduced as the deputized representative of His Honor the Mayor of New York City.

Mr. Lewis said the experience of New York City has clearly demonstrated that managing a department of street cleaning is "a man's job." He spoke of the advanced standards in the work set up by Colonel George E. Waring twenty years ago and of the efforts of succeeding commissioners to follow in his footsteps. The annual appropriations for carrying on the work of the New York Department of Street Cleaning, he said, approximate \$8,000,000, exclusive of the cost of snow removal. "Such responsible tasks should be placed in the hands of men of ability," he said. "In this city it is now recognized that a technical man can best perform the duties of street cleaning commissioner; that is why the present commissioner was selected for the work."

Mr. Lewis closed by extending, in the name of the mayor, a hearty welcome to the members of the society, and expressed the hope that their stay in the city would prove both profitable and pleasant.

MR. WILSON'S RESPONSE.

The president called upon vice president Wilson to respond to the welcome extended by Mr. Lewis. Mr. Wilson said:

Mr. Nelson P. Lewis:

On behalf of the Society for Street Cleaning and Refuse Disposal of the United States and Canada, I desire to express our keen appreciation of your most cordial welcome. It is gratifying to us to know that you do not underestimate the value and importance of our convention, for we feel that our work contributes to the comfort and well-being of the people to a greater degree, perhaps, than that of any other individual municipal service. That His Honor the Mayor appreciates this is evident from the fact that he has assigned to welcome us a gentleman who is in thorough sympathy with our work and in intimate touch with our aims and objects.

The urban municipalities represented by us are deeply indebted to your city for the lessons she has taught us. Under the wise guidance of your commissioner, who has shown himself to be a most worthy successor of that great protagonist of cleaner streets, Colonel Waring—whose memory we all revere and whose career is ever an inspiration to us—many innovations and improvements hitherto believed to be impracticable, if not impossible of accomplishment, have become actualities. As a consequence we have learned to regard nothing in the way of improvement as impossible of achievement. Individually we are perhaps the most severely criticised body of men engaged in municipal work. Like the fond mother who, seeing her son marching past with his regiment, exclaimed admiringly that her Jock was the only one in step, our critics are always right. Criticism, however, is our portion. We invite and welcome it, more especially when we believe it to be given in that true civic spirit which is so helpful and encouraging to every municipal executive.

It must be a source of gratification to you, sir, to know that our good friend and president, commissioner Fetherston, is the father of the movement which resulted in the formation of this society one year ago.

I would ask you, sir, to accept for yourself and to convey to His Honor the Mayor, representing the citizens of New York, the heartiest thanks of this society for the cordial welcome which, through you, has been so graciously accorded us.

PRESIDENT'S ADDRESS.

Gentlemen of the Society:

In formally opening the business session of this, the second convention—really the first after the organization meeting one year ago—of the Society, it may be expected that I will review the work of the organization during the year. As, however, the past year has necessarily been one devoted largely to propaganda, in an effort to establish and build up the Society, rather than to administer its affairs, and as that work has very properly been under the direction of the Executive Committee, I feel that you should look to the reports of that committee and of the Secretary-Treasurer for a record of the year's labors. Nevertheless, I would like to say that the year's experience has confirmed the belief I expressed at our organization meeting, in October, 1915, to the effect that this Society should be a clearing house for the street cleaning officials of the United States and Canada, which it will surely become if we can succeed in developing it along the lines laid down in its declaration of objects. As I see it, that is the work ahead of us.

It has been suggested that, as my contribution to the information concerning the work of street cleaning and refuse disposal officials which will be presented at this convention, I relate to you briefly the experience of New York City in dealing with the trade waste problem. This perplexing question has, no doubt, confronted some of you already; others of you, if you remain in your present official positions, will inevitably have to face it, sooner or later. (President Fetherston's comments upon trade waste will appear in a future issue of Municipal Journal.)

SECRETARY-TREASURER'S REPORT.

The secretary-treasurer reported that during the past year his office had sent out 2,025 pieces of first-class mail, 1,350 copies of prospectus and 1,980 copies of circular letters, blanks, etc. Since the formation of the society, one year ago, twenty-eight new members, including seven municipalities, have enrolled. The receipts for the year were \$380, expenditures \$252.40, leaving a balance in the treasury October 10, 1916, of \$127.60.

The report was referred to the auditing committee.

EXECUTIVE COMMITTEE'S REPORT.

The Executive Committee submitted for the record copies of propaganda circulars distributed during the year, together with the substance of voluminous correspondence. The committee reported two changes in its

personnel, occasioned by the retirement from actual street cleaning service of Messrs. Kennedy and Leininger, of Buffalo and Chicago, respectively. William F. Schwartz of Buffalo and A. W. Miller of Chicago were selected by the committee to fill the vacancies.

The committee reported that the exhibition of apparatus was abandoned this year, in response to an expressed wish of a majority of the manufacturers, who stated to the committee that pressure of work in their plants made it impossible for them to prepare and install satisfactory exhibits.

The cities of Cleveland, Ohio, and Springfield, Massachusetts had made known to the Executive Committee a desire to entertain the society in 1917, and the committee asked the convention to consider these invitations when selecting a convention city for 1917.

On motion, the report of the Executive Committee was accepted.

SPECIAL COMMITTEES.

Moved by Mr. Tuska: "That a special committee of two be appointed to report an amendment to the membership provisions of the Constitution, so as to provide for the admission to membership of sanitary engineers, whether or not such are directly engaged in street cleaning or refuse disposal work."

After some discussion the motion was adopted and the president appointed as such committee Messrs. Tuska and O'Toole.

Under a general discussion of the question of extending the membership of the organization, Mr. O'Toole expressed the opinion that members of the society could do a great deal more in that respect than they had done. Mr. Hanna said there were many opportunities for spreading information concerning the society, if the members would bear the subject in mind when meeting street cleaning officials who were not already members. He thought it was a mistake to leave to the secretary all of the work of arousing interest in the society. Mr. Sutter moved that a committee of three, to be known as the Organization Committee, be appointed to work in conjunction with the secretary in securing members. The motion was adopted and Messrs. Russell, Hanna and Holmes were appointed as the Organization Committee.

On motion a committee of three was appointed on nomination of officers for the ensuing year and selection of 1917 convention city.

The secretary-treasurer called attention to the fact that several new members had joined the society and paid a year's dues during the six weeks just preceding the convention. As the dues paid in October, 1915, were credited to cover the calendar year of 1916, the secretary asked if the precedent thus established should be followed and the payments to which he now referred should be credited to cover the calendar year of 1917. On motion the question was referred to the Executive Committee, with power to act.

A general discussion was had on the questions of printing the proceedings of the convention and of arranging for official publication in an established technical journal. The general consensus of opinion was that such a course was desirable and, on motion, the subject was referred to the Executive Committee, with the recommendation that it be given favorable consideration.

RECESS.

The society reconvened at 2:30 p. m., with president Fetherston in the chair. Throughout the session there was close observance of the official programme, beginning with an address on

"STREET CLEANING BY THE WET SYSTEM," BY GUS H. HANNA.

(Mr. Hanna's paper will appear later in Municipal Journal.)

Following a discussion of Mr. Hanna's paper, and as part of the same subject, there was presented a paper on

"STREET CAR FLUSHERS," BY A. T. RHODES.

(Mr. Rhodes' paper will be found in another part of this issue of Municipal Journal.)

In response to a question, Mr. Rhodes said that inauguration of the street car flushing system had enabled the city of Worcester to dispense with night sweeping gangs.

"THE NEW YORK ANTI-LITTER LEAGUE."

R. Ross Appleton, treasurer of the New York Anti-Litter League, was presented to the convention. He said:

When the Society for Street Cleaning and Refuse Disposal was conceived a great idea was born. It has a great mission, in that it presents opportunities to the cities of the country to become familiar with the best methods employed by each city in dealing with a municipal problem which is second to none in its important relation to the health and comfort of the people. I am more than pleased that I am given an opportunity to come before the convention of this society and permitted to lay before you gentlemen a few facts in relation to a movement started by a few public-spirited New Yorkers, a movement destined to be not only helpful to the city's Department of Street Cleaning, but fraught with great possibilities in its effect upon the health, comfort and beauty of the city. I refer to the New York Anti-Litter League, of which I have the honor to be treasurer. The league grew out of the knowledge that our Department of Street Cleaning, which was doing its full duty, was entitled to the practical co-operation of the progressive citizenship. We realized that littered streets would always be an eye-sore in our city until our citizens came to understand that it is impossible for a street cleaning department to keep continuously tidy the streets of a people who have no regard for the appearance of the public thoroughfares, but who cast upon the sidewalks and streets any and all kinds of waste material, at any and all times. We believed not only that "If each before his own door swept, the village would be clean," but if each refrained from carelessly or recklessly casting litter about, our city would take its place among the cleanest cities in the world.

The Anti-Litter League stands for the extension of the "Clean-Up Week" idea through all the weeks of the year. More especially do we advocate the doctrine of keeping the streets free of litter after they are cleaned. We believe the police will assist such movements as ours when they see that we are in earnest, and it is also true that a majority of the people want the ordinances relating to street litter enforced.

May I relate in this connection a little incident of recent occurrence? I was coming down town in a Broadway car when my attention was attracted by a pair of boisterous youths who were engaged in kicking the fragments of a newspaper all over the car. A policeman was sitting across the car from me and I asked him why he didn't restrain the disorderly fellows.

"What can you do with wild Indians like them fellers?" was his response.

"Do you mean to say that you will not make these boys obey the law?" I asked.

The policeman saw I was in dead earnest and, jumping to his feet, exclaimed: "Begorra, I'll make 'em pick up them papers and ate 'em, if ye say so."

And he did make them pick up every scrap.

If you will permit me to say it, I think you should have anti-litter leagues in the cities you gentlemen represent. I believe you would find them helpful in keeping off your streets litter which makes them unsightly and gives the impression to the uninformed that you are not performing your duties as street cleaners. During the recent epidemic of infantile paralysis the Mayor of New York appointed a committee of citizens to inspect the condition of the city's streets. I was honored by appointment upon that committee. We went all over the city, covering over ninety miles in our tour of inspection. We found the streets as clean as those of any of the model cities of Europe; but, owing to the littered condition of the sidewalks, over which our Department of Street Cleaning has no jurisdiction, the general impression was anything but pleasing.

"HAND SWEEPING," BY RICHARD T. FOX.

(This paper will appear in a future issue of Municipal Journal.)

The day's session closed with the screening of a motion picture film, entitled "A Day's Work." The picture vis-

ualized the activities of the New York Department of Street Cleaning during an ordinary day, beginning with the morning roll call at the section stations and stables and closing with the turn-in at night.

THE SECOND DAY'S SESSION.

The School of Instruction.

At 9 a. m. Saturday members of the society assembled at the headquarters building of the "Model" or Sixth District of the New York department for the purpose of inspecting the department's School of Instruction. This school, which is the only institution of the kind in the world, has been in operation less than a year, but it has already attracted wide attention.* The visiting representatives were deeply impressed with the value of the school and displayed marked interest as its various features were made plain to them. They closely observed every movement of the instructors and listened attentively as the "rookie" classes were put through their morning lessons. The school not only trains the men before they are assigned to full duty, but it makes clear to each of them why they are to do their work in a particular way.

The society reconvened in convention hall at 10:30 a. m.

W. P. Capes, director of the Bureau of Municipal Information of the State of New York, addressed the convention at some length, explaining the working of his bureau. He said there were fifty-eight New York cities affiliated with the bureau, which is supported entirely by its membership.

D. J. Mangan, D. V. S., read a paper on "The Horse in Street Cleaning Work," and was followed by S. I. Rainforth, M. D., who discussed "Accidents and Diseases to Which Street Cleaners Are Subject."

(These papers will appear in future issues of Municipal Journal.)

TO TEST APPARATUS.

Mr. O'Toole, prefacing a motion to appoint a committee, said:

From time to time executives of municipal street cleaning and refuse disposal functions are solicited to pass judgment upon the merits of so-called labor-saving, cost-reducing and method-changing devices. Many of these devices are expounded by interests that are insistent in their attempts to influence or force practical officials to commend their apparatus or system. At times these interests influence prominent citizens and civic bodies to promote their ends, and often responsible officials are placed in embarrassing positions by reason of these forces, many of whom have never given five minutes to the study of the practical questions which enter into our work. On the other hand they have criticised every public official who has refused to give of his time and energy and interest himself in the so-called demonstrations and tests conducted by promoters of apparatus and their allies.

Much could be said along these lines, but suffice it to say that many municipalities have been fleeced in the purchase of useless machines or equipment on this account. I believe this society has progressed far enough to secure the confidence of bona fide inventors and men engaged in the manufacture of machinery and equipment to meet the needs of the modern city, and that the latter would welcome any arrangement that could be made by this society to provide a fair and impartial test of the many different types of apparatus which from time to time are placed upon the market. To this end I believe a committee should be chosen from members of this society to draw up specifications under which we could conduct tests, by employing practical factors to demonstrate the claims put forward by promoters. I, therefore, move that such a committee, to consist of three members, be appointed by the president.

After some discussion, all favoring the proposal, the motion was carried, and the president appointed Messrs. O'Toole, Wilson and Fox as the committee.

The auditing committee reported that it had gone over the report and the accounts of the secretary-treasurer

and found the condition as reported by that officer. Auditing committee's report adopted.

OFFICERS FOR ENSUING YEAR.

The committee on nominations recommended the following as officers of the society for the ensuing year: President, J. T. Fetherston; First Vice President, G. B. Wilson; Second Vice President, Gus H. Hanna; Third Vice President, John F. O'Toole; Secretary-Treasurer, Joseph R. Buchanan; Members of the Executive Committee, above named officers and A. W. Miller, A. T. Rhodes, William F. Schwartz, Joseph J. Norton and J. E. Nantel. The committee recommended that the city of Springfield, Massachusetts, be selected as the place of holding the convention of 1917.

On motion the nominations offered by the committee were approved and the gentlemen named were elected to their respective offices. On motion the recommendation of Springfield as the convention city of 1917 was referred to the Executive Committee.

ADVISORY MEMBERS ADDED.

The committee to whom was referred the proposal to so amend the constitution as to provide for the admission to membership of sanitary engineers not directly connected with street cleaning and refuse disposal work presented a divided report. Mr. Tuska, of the committee, submitted a recommendation "that Section 3, Article III, of the Constitution be amended by adding after the word 'sanitation,' the words 'and such individuals as are directly interested in street cleaning and waste disposal work, excepting those restricted to Associate Membership.'"

Mr. O'Toole, of the committee, declined to accept the suggestion of Mr. Tuska as the report of the committee. He was not yet satisfied as to how far membership in the society could be extended with safety to the organization. He was not, however, in favor of opening the doors as widely as proposed by Mr. Tuska. After a lengthy discussion of the subject the following, offered by Mr. Buchanan, was adopted: "That the question of amending the Constitution for the purpose of extending its provisions in relation to membership eligibility be referred to the Executive Committee, with instructions to embody in the Constitution a section covering an additional class of members to be known as 'Advisory Members,' such members to be endowed with the same rights and privileges as are now enjoyed by Associate Members and to pay the same rate of dues as are paid by Individual Active Members."

CONTROL OF MATERIAL AND SUPPLIES.

A. Schreiner of the New York Department of Street Cleaning addressed the convention on the subject of department materials and supplies. He illustrated the methods employed in the New York department by displaying sample record and checking sheets, copies of which he supplied to members of the convention. At the conclusion of his address Mr. Schreiner extended an invitation to members of the society present to accompany him on a tour of the four-story storehouse in which are kept the materials and supplies used by the New York Department of Street Cleaning.

The president announced that A. W. Miller of Chicago had found it impossible, at the last moment, to attend the convention and that his paper on "Chicago's Problem" would appear in the published proceedings of the convention.

Thanking the members for their close attention to the business of the society and for the uniform courtesy and good will shown throughout the proceedings, the president then declared the 1916 convention of the society closed.

JOSEPH R. BUCHANAN, Sec.-Treas.

*A description of this school was given in Municipal Journal for October 26th.

The WEEK'S NEWS

The Interstate Use of Automobiles—Birmingham's Street Tax Upheld—San Francisco Survey on Health and Street Cleaning—End of West Virginia Gas Rate Case—Plans for Improving Chicago's Lighting—Two-Platoon Wins in San Francisco—Fires in Norfolk, Va., Canastota, N. Y., San Francisco and Davis, Cal.—Research Bureau at San Francisco—To Make Bridges Safe After Boston Catastrophe—Washington De-fines "Rush Hour"—Flood Control and Water Conservation in Pennsylvania.

ROADS AND PAVEMENTS

Interstate Use of Highways Before Supreme Court.

Washington, D. C.—Whether a state can tax a motorist road traveler from another state for the use of its roads will be decided in the near future by the United States Supreme Court, the arguments for the so-called New Jersey test case prepared jointly by the American Automobile Association and the National Automobile Chamber of Commerce having been presented. John W. Griggs, former attorney general of the United States, was the spokesman for the owners' organization and Charles Thaddeus Terry appeared for the car makers. The case of Frank J. Kane vs. the state of New Jersey was based on the interstate journey of the plaintiff from New York to Pennsylvania, he being convicted and fined for a violation of three provisions of the New Jersey law—first, that he had failed to register his automobile in New Jersey; second, that he failed to pay the tax imposed on non-residents; and third, that he failed to file with the secretary of state a power of attorney. The argument presented by Messrs. Griggs and Terry set forth these contentions:

1. It being admitted in the record that the fees charged for the operation of automobiles over the highways of New Jersey result in a large surplus revenue to the state over and above the expenses of examination, licensing, registering and inspecting the automobile traffic on the highways, the charge is a tax which is not in conformity with proper tax laws in that the motor vehicle is burdened with a heavy impost, irrespective of its value, whereas, other property is taxed according to its value.

2. The so-called "license-fee" being in reality a tax, as shown by point "1" is unreasonable and void as such tax because even assuming that it is a charge for the use of special facility, to-wit—the improved roads furnished by the state of New Jersey, it is unreasonable because a lump sum is charged irrespective of the question how much or to what extent the automobile uses the roads. The charge is unequal,

disproportionate and not upon any scientific or logical basis, and, therefore, improper and illegal.

3. The improved roads of a state are not a "special facility" afforded by the state to automobiles, but their construction and presentation to them are simply governmental functions, which should be paid for out of the general tax fund in the same way that the police force and the fire department are afforded for the use of all citizens, irrespective of the amount of use. Therefore, no special charges or impost can be levied for their use to any particular class of users.

4. That the law is discriminatory and class legislation in that even assuming that the "license fee" is a charge for the use of the roads, it is not imposed equally upon all the users of the roads. Horse-drawn vehicles use the roads and use up and destroy the roads in a large degree, and, therefore, if the tax were to be an equal and uniform tax, it must be imposed upon horse-drawn vehicles as well as upon automobiles.

5. The requirement that before any non-resident shall use the highways of the state, he must file a power of attorney with the secretary of state, and authorize such secretary to receive service of process for him, is ousting him of his domicile and imposing a requirement which is not imposed upon any other class of non-resident citizens of the United States going into the state of New Jersey. It is assuming in advance that the automobile user is likely to commit a criminal act which is absurd on the face of it. He is no more likely to commit a criminal act than any other non-resident entering the state of New Jersey and even if he were, such a method of enforcing the criminal law is unknown to our jurisprudence.

6. The requirement of a power of attorney from non-residents and the imposition of a tax upon non-residents and the requirement that before the highways shall be used by non-residents shall make application and take out registration, are burdens on interstate commerce, which the constitution of the United States forbids under the Fourteenth amendment thereof.

Street Plans for Harbor Section.

Syracuse, N. Y.—The common council, mayor Walter R. Stone and city engineer Henry C. Allen are planning to open new streets and extend old streets for the purpose of putting the new barge canal terminal within easy access from all parts of the city. The work will be done in conformance with a plan prepared by Clarence E. Howard, consultant of the City Planning Commission, which has been officially approved by the commission and city officials. The waterways committee of the Chamber of Commerce has been active in bringing about the demand for immediate action in the problem of making the terminal accessible. The Howard plan, which has been in process of development for more than a year, meets with the approval of the committee. Under the Howard plan two main thoroughfares must be provided at once. They are so carefully plotted that even if no other streets are provided at once the needs of the city will be cared for reasonably well. The extension of Solar and Kirkpatrick streets will form the most important thoroughfares. The streets as now planned will be at least 100 feet wide at the harbor entrance, thus providing ample trucking space in front of the warehouses the state is to build. The plan is part of a program for industrial development of the terminal section which is being actively promoted by city officials and commercial organizations.

Withdraw State Reciprocity Privilege for Trucks.

Harrisburg, Pa.—The automobile reciprocity privilege existing between the state of Pennsylvania and the state of Delaware has been withdrawn insofar as it affects commercial vehicles. Delaware has notified Pennsylvania that under an amendment to the automobile law of that state all Pennsylvania commercial cars must be registered in Delaware as soon as they cross the state line. Because of this notification from Delaware, state highway commissioner Black has issued a ruling that all Delaware commercial vehicles must secure Pennsylvania registration immediately upon entering the state of Pennsylvania. This applies to all forms of motor vehicles used for commercial purposes irrespective as to whether they are pneumatic or



HOWARD STREET PLAN FOR SYRACUSE HARBOR SECTION.

solid tired. Notice has been sent by the automobile division of the state highway department to the authorities in all towns in Delaware County that their police officials should stop all Delaware commercial vehicles found in Pennsylvania and notify the drivers that they must secure Pennsylvania registration. A notice was also sent to the police authorities of the city of Philadelphia. The effect of this ruling is far reaching because it applies not only to those commercial vehicles engaged in continuous interstate commerce between Pennsylvania and Delaware but also to commercial vehicles making only occasional trips between the two states.

Bond Issue Lost.

Joliet, Ill.—The voters at the recent election, according to incomplete returns, disapproved of the \$1,500,000 bond issue for good roads in Will county. Although the campaign had been short, the good roads boosters had hoped for success, but the national election questions made the vote on the bond issue drop behind. The roads were to be concrete, bituminous macadam, waterbound macadam and gravel, the most important leading into Joliet.

California Gets First Federal Aid.

Washington, D. C.—California is the first state to receive federal aid, under the recently enacted government good roads act. The application of the state highway commission was forwarded the day that the President signed the bill and the money is available now. Five of the six projects submitted have been approved by the federal office in Washington. These total slightly more than twenty-five miles and involve an estimated expenditure of \$314,000. Of this sum, the government in the first year will appropriate \$140,000 for the rural post routes and \$155,000 for forest roads. For the rural routes the state is expected to pay an equal amount. The counties in which the forest roads are constructed are expected to pay part of the construction cost.

Change in Highway Line Illegal.

Indianapolis, Ind.—The supreme court held, in affirming the DeKalb circuit court, that the statute authorizing the establishment of a highway by the board of commissioners on the line of a previously used highway does not authorize the board to vary the line of the highway to take in any lands not previously used as a highway, although the road extends along the line between two land owners, and the statute provides that where the road is along such line between two land owners it shall be taken in equal quantity from each owner. The court points to the fact that the present law adopts the language used in a former law which had been construed by the court not to authorize the taking of any land unused as a part of the highway, and says the court is bound by the former construction of the law.

Street Tax Upheld in First Case.

Birmingham, Ala.—Judge William E. Fort of the Jefferson County Court has held that the street tax ordinance of the city commission is constitutional, and a fine of \$5 and costs for violation of the terms of the civic statute was constitutional. Attorney Horace C. Wilkinson at once filed notice of appeal. The court does not find the ordinance inconsistent with the general laws of state. "With the policy of the city government in enacting or enforcing said ordinance by arrest and fine (within reasonable and legal limits), this court has nothing to do, the only authority given the court being to construe the legal and constitutional questions raised," says the opinion. An appeal was taken to the Supreme Court, but it is considered by leading attorneys that the efforts to break down the street tax ordinance through the courts is practically hopeless. Only the repeal of the ordinance by the commissioners can save the citizens from the imposition. The opposing attorney attacked the theory of the city that it could levy a street tax under its present charter powers and also that if it did have the right to impose a street tax the constitution of the United States prevented the municipal authorities from jailing any person who refused to pay it. Something like \$30,000 in street taxes has been collected already and there is much dissatisfaction among the citizens.

SEWERAGE AND SANITATION

Lima Votes Against Sewer Improvements.

Lima, O.—Contrary to the result of incomplete returns from which it appeared that the voters had decided in favor of the \$500,000 bond issue for sewers, the official totals indicate that the issue was lost. City officials are now in a difficult situation as they have been ordered by the state board of health to construct the sewerage system. Mayor Simpson has notified the state health board of the defeat of the bond issue, and city officials are disposed to leave the next move to the state body. The order from Columbus was in the form of an ultimatum, ordering the work completed before September 9, 1918. City officials are agreed that the state board has power to force the city to do the work or to send their own men here and build the sewers, raising the money through a special tax. The state, however, would have to wait until September, 1918, before it could take any action. Council has asked the city solicitor to secure an opinion on the Benze law, an act which permits a city to issue bonds for sanitary improvements without the consent of the electors at the polls. If the law has not been altered by any measure passed since 1913, council may take the initiative and issue the sewer bonds on its own initiative. Some city officials are disposed to let the matter rest until the spring rains begin filling cellars in many parts of the city, and then to call a special election to pass on the bond issue again. As the measure lacked but 129 votes of securing the necessary two-thirds majority, and many voters did not mark their bond ballots, officials believe the measure would carry by a big majority next spring.

Cannot Trace Typhoid Epidemic.

Bluffton, Ind.—The state board of health has as yet been unable to trace the source of the typhoid epidemic in Bluffton and Wells County. More than fifty cases have been reported from Bluffton alone and nearly one hundred from the county. Dr. H. H. Mitchell, who has been investigating the epidemic, believes it was spread by a "carrier" during a street fair or by insanitary drinking fountains.

Research Bureau Advises Abolition of Health Board.

San Francisco, Cal.—Abolition of the Board of Health, as at present constituted, and the centralization of authority and responsibility in a single commissioner, is the leading suggestion of the municipal research survey of San Francisco in regard to public health. The survey finds that the present members of the board are doing fairly well, but that the system is bad in that it is wide open to political influence, which, it is stated, has doubtless been exercised in the past and may be again in the future. Another radical recommendation is that suggesting that fumigation of private premises after cases of scarlet fever and diphtheria be abandoned as it has been in New York and other cities. Under a single commissioner the divisions suggested are: Publicity and education, accounts and records, with bureaus of food inspection, sanitary inspection, medical service, school hygiene and laboratories. An unusual amount of red tape is found in the records of the board, which it is suggested be cut out. The report states that the board of health has already followed the recommendations of the survey in the matters of uniform hospital records, form of certificates and uniform system of dietetics. Full time work of physicians in the health department service is recommended. Sanitary inspectors in uniform are advised. A dog-muzzling ordinance is urged. The report contains the following on public health expenditures in San Francisco:

"The health department was allowed \$884,942 for the fiscal year 1916-17. The report finds that on the basis of an estimated population of 475,000 San Francisco pays 46.7 cents per capita for health. This is by no means a high price to pay as compared with that paid by other American cities. According to the census tables, San Francisco, though second in population in its class, is fourth in the amount spent for health conservation. San Francisco spends less for the conservation of child life than any other city of its class. The figures show that San Francisco during 1915 spent 2.1 per cent of total expenditure for conservation of child life. Los Angeles spent 28.2 per cent. San Francisco stands sixth in the per capita

cost for health conservation. Although it is believed that San Francisco is spending far too little for preventive health service, it is not urged that any considerable increase of appropriation be allowed under the present organization, which is believed to lend itself to extravagance rather than economy. It is extravagance to pay a trained health officer \$3,600 a year and require him to perform a large amount of routine work which should be delegated to subordinates; it is extravagance to employ physicians on part-time service; it is extravagance to pay salaries for work not performed, as in the case of several inspectors who have been on sick leave for long periods, and it is extravagance to send inspectors into the field without having that field so mapped out as to direct their work to best advantage."

Clean Homes After Sanitary Survey.

Tuscaloosa, Ala.—Dr. F. S. Harrington of the United States Public Health Service who came to Tuscaloosa March 9 for the purpose of improving sanitary conditions in Tuscaloosa, has left after having completed his work. Tuscaloosa now claims to be 99 per cent sanitary and to be the cleanest city in the state. During the year 971 houses in Tuscaloosa have installed sanitary closets, and now there is not a single old type open closet in the city. The fly is almost exterminated. Eighteen thousand feet of open drains have been completed and a \$10,000 storm sewer system is in course of construction. Malarial mosquitoes are being eradicated, and in a few years malaria will be eliminated in Tuscaloosa. This campaign has cost the city of Tuscaloosa \$5,800 per year in salaries and expenses incident to the health department, which expenditure the county shared. The results show the value of the work. Last year there were 17 deaths from typhoid fever in Tuscaloosa. This year there has not been a single death, even though the Warrior river overflowed this section, and conditions were favorable for the scourge. Disease of all kinds has been lessened. The people of Tuscaloosa are unanimous in their demand that this work go on, and the city and county plan to keep Dr. Durret and the corps of assistants, which include one assistant, one sanitary inspector, one school nurse and one tuberculosis nurse, employed to continue the fight against disease. Eighty-four per cent of the homes within the three-mile limit of Tuscaloosa have also cleaned up. A sanitary survey has been made of 1,300 homes in Tuscaloosa county, and most of these homes have made improvements. Northport has practically followed all suggestions, and all corporations in the county have, with one or two exceptions, cleaned up their camps.

WATER SUPPLY

Municipality Buys Waterworks.

San Rafael, Cal.—With the payment in court here of \$1,625,898.71, to the Marin Water and Power Company and the North Coast Water Company, the Marin Municipal Water district came into actual possession of all of the water-serving utilities of southern Marin. Of the money paid, \$1,200,150 went to the Marin Water and Power Company, \$290,748.71 went to the North Coast Water Company and \$135,000 was placed in escrow to indemnify both companies against damage as a result of appeals now pending in the various courts.

Profitable Municipal Plant.

Gridley, Cal.—That municipal ownership is profitable in Gridley is evidenced by figures showing the revenue the city derives from its water and light and power systems. The gross profit from both systems for the last fiscal year was \$5,519.07, or over 11.7 per cent on the investment. The revenue from the waterworks system for the last fiscal year was \$4,406.20 and the expenses \$3,517.38, leaving a gross profit of \$888.82. The revenue from the light and power system was \$12,178.80 and the expenses \$7,548.55, leaving a gross profit of \$4,630.25. The income from the two systems, plus a tax of 70 cents on the \$100, has enabled the city to pay all running expenses and cancel annually two bonds of \$1,000 denomination each, besides keeping up both systems. The city in April, 1907, voted \$33,000 bonds for the purpose of installing a municipal waterworks system and for street lights. Only \$3,000 was set aside for the lighting system. As the water system proved to be a success, the city in 1911 voted \$17,000 bonds for the acquisition of the light and power system. The city sold the suburban branches of the system to the Pacific Gas and

Electric Company for \$2,000, reducing the actual cost to \$15,000. The city recently entered into an agreement with the Pacific Gas and Electric Company whereby it will secure a material reduction in the cost of electricity, the new rate to be a graduated one instead of the flat rate now in force.

Municipal Plant Makes Good.

Kinston, N. C.—Municipal ownership of public utilities is profitable for Kinston, according to a report for the water and light department, by John E. Weyher, the superintendent. The report shows that in spite of heavy operating and "extension" expenses the water and light works in the last fiscal year paid to the city \$10,839.98 in profits. The income of the plant was not quite \$50,000. The municipality has laid gas pipes in sections preparatory to construction of a gas plant, which probably will be operated by the city.

STREET LIGHTING AND POWER

Another Fight on Kansas Gas.

Topeka, Kans.—An injunction suit to prohibit the local gas company collecting fifty cents a thousand feet for natural gas is to be brought in the district court here by a citizens committee, headed by Governor Capper and the Topeka Industrial Council, representing the Topeka labor organizations. The Topeka company, when the Kansas Natural receivers announced an increase of rates, went even above those of the receivers. It raised the local rates to fifty cents a thousand cubic feet for each of the first three thousand feet and thirty-five cents a thousand for all gas used after this minimum. Other cities are paying not to exceed thirty-five cents a thousand feet.

Company Fights on Franchise.

Oakland, Cal.—The city council has received a communication from the Great Western Power Company, announcing that it has decided to fight the opinion of assistant city attorney George Jackson on the franchise question. Jackson recently held that the granting of the second franchise for thirty-five years automatically revoked a former franchise granted for a fifty-year term, a contention which, if true, will cost the company about \$400,000 in the next thirty years. In the meantime, there lies unaccepted in the city clerk's office a check for \$11,030.58, first year's payment on the second franchise, according to Jackson, and first payment on both franchise, according to the company.

Compromise in West Virginia Gas Case.

Charleston, W. Va.—A compromise has been effected at Pittsburgh by representatives of the Manufacturers' Light & Heat Co. and the state of West Virginia in the case in which that company has been fighting for nearly three years against an order of the public service commission reducing its rate to consumers of gas in ten of the northern counties of the state. The compromise, which is declared to be entirely satisfactory to the state, was reached while a hearing was in progress before special master J. W. Vandervoort, of the United States district court. It provided that the gas company shall refund to its consumers in West Virginia two cents on each thousand cubic feet of gas consumed in the time that has elapsed since the order of the commission went into effect, nearly three years ago; that the gas company bear the entire expenses of all litigation that has occurred in that time; and that the gas company shall be permitted to keep in effect the rates they are now charging, except in those counties near the gas field. The Manufacturers' Light & Gas Co. case has been one of the longest and most noted in the history of the state in many ways. The state was moved to accept the compromise because of the great change in conditions surrounding the production of natural gas since the case was started in 1912, and because many of the manufacturers in the northern section of the state came to the commission requesting that the gas company be permitted to put its proposed rates into effect. The manufacturers were willing to make this request on the agreement of the gas

company to spend any amount of money necessary to furnish them with a sufficient supply of gas this winter. There was considerable shortage of gas last winter. The refund of two cents on each thousand cubic feet of gas consumed in the last three years will be made to domestic consumers only and will amount to about \$20 to \$30 per family, it is estimated. The entire costs of the case, with the exception of attorney's fees for the state, have been assumed by the gas company. This, it is understood, will amount to fully \$200,000. One item of the company's costs alone—a complete inventory of its plants and assets and liabilities—amounted to \$40,000. The company, by the order of the commission to be entered at once, will be permitted to put its rates into effect as of Nov. 1. These rates are those asked originally by the company, except in the territory located in the gas producing counties. The order of the commission will provide for the dismissal of the case from its docket without prejudice to either the gas company or the original protestants. It does not effect the criminal case against A. Leo Weil, counsel for the gas company, who is under indictment for an alleged attempt to bribe former members of the public service commission.

Vote for Municipal Heat and Power Plant.

Shenandoah, Ia.—This city has voted in favor of a municipal heat, light and power plant at a special election. The vote on the municipal plant was 660 for the proposition and 377 against it.

Company Must Furnish Service.

Winthrop, Me.—One of the most important decisions that has been handed down by the public utilities commission of the state since assuming office is made in the case of George B. Churchill and others vs. Winthrop & Wayne Light & Power Co., ordering the utility to furnish service to the complainants. The decision involves principles new to this state and hitherto not announced by the commission. On March 31, 1916, George B. Churchill and ten other citizens of Winthrop filed with the commission their complaint against the Winthrop and Wayne Light & Power Company alleging a refusal on the part of the utility to render service to the complainants. The petitioners live in that part of Winthrop known as Sturtevant hill. Some months ago the company began an extension which will pass along a highway other than the one on which petitioners live, but which at one point will be within less than two miles of their homes. A verbal agreement was made with certain conditions under which service would be given but the terms of this agreement are now denied. The commission holds that each public utility must within reason fully serve its granted territory even though some part of such service may yield no profit, or may render it necessary to recoup such losses by somewhat higher charges in other portions of its territory, and adds, "because courts and commissions without exception have held that the authority exists, we have full authority to require to make reasonable extensions into any part of its territory."

Improving Chicago's Lighting.

Chicago, Ill.—Chicago sets out to be the best lighted city in the world, according to plans completed by William G. Keith, head of the department of gas and electricity, and submitted to the council committee on finance. All the plans of commissioner Keith call for a total appropriation for 1917 of \$2,226,100. One of the most important of the many plans submitted by commissioner Keith is a proposed change in the present type of lighting which will not only be the means of saving \$300,000 annually, but is expected to put an end to the large number of accidents recorded each year. The present style of lamp-post which permits children to obtain a footing and to climb them are to be eliminated and a new post, the special design of commissioner Keith, is to be installed. Four children were killed during the last year by climbing the poles to look at the lights. Two employees of the department of gas and electricity were killed. The new posts will be 10 feet 6 inches in height instead of 9 feet 6 inches as at present, and practically impossible to climb. As a further means of preventing deaths and accidents an entirely new system

of lighting is to be installed in the residential districts, which is to be known as the "group lighting" plan. Under the present scheme 220 lights are fed from one feed cable carrying 5,000 volts. It is this high voltage which causes instant death to those coming in contact with exposed wires or parts of the lamps. Also, if one lamp is put out of commission, all the others on the same circuit are also made useless. It is when this occurs that children climb the posts in an effort to repair the damage or to turn on the light. Commissioner Keith estimates that the school children of the city cause \$15,000 damage annually by breaking globes and lamps—10 per cent of renewals being due to this cause.

Municipal Plant Cuts Rate.

Wellington, Kans.—The city commissioners have put into effect a rate of two cents a kilowatt for electric current for cooking and heating. The rate for lighting remains at eight cents and for motors at five cents. The city plant is making a profit and is in fine condition. The city officials have estimated that the rate of two cents for cooking and heating meets the local natural gas price of twenty-seven cents per thousand. The commissioners have installed various kinds of cooking and heating stoves for demonstration and will sell this equipment at cost to encourage a boost in the day load.

FIRE AND POLICE

Two-Platoon Plan Wins.

San Francisco, Cal.—The firemen of the city are victorious in their campaign for the two-platoon system. Count taken in 661 out of 684 precincts gave the plan a majority of 5,614—43,920 in favor to 38,306 against. The recent report of the survey by the Bureau of Municipal Research was opposed to the plan because of the increase in cost.

All Apparatus at Fire.

Norfolk, Va.—A \$400,000 fire which swept the water front was fought by all the available apparatus in the city and two fire autos sent by Mayor Hawley and Chief McLaughlin of Portsmouth. The fire started in a furniture warehouse and seven buildings were destroyed and the stocks of sixteen concerns damaged. Ten members of Station No. 1 had narrow escapes from being crushed by a falling wall—four were struck by bricks and injured. Tugboats gave valuable assistance by sending in good streams from the water side of the burning buildings.

City Manager to Start Police School.

San Jose, Cal.—Plans for the establishment of a school for policemen and another for the firemen in the employ of the city of San Jose, have been announced by city manager Thomas H. Reed and his assistant, Paul Eliel. The schools will be opened probably in the city hall at about the time of the beginning of the next fiscal year at the end of December and will take the men through a study of all phases of their work. The course for the firemen will include lectures by some of the most prominent fire chiefs and experts on the coast and will include demonstration and practice in climbing, jumping and rescue work and study of the lighting methods. The firemen will be taken through a thorough course in first aid by some physician. The course being arranged for the members of the police department will be thorough, beginning with a study of the ordinances of the city, laws of the state and the nation. The policemen will be required to study practically the whole penal code. They will also be given a thorough training in first aid work. One of the important parts of the course will be the study of criminal identification, including finger prints, the Bertillon system and the "modus operandi" system. Methods of police investigation will be taken up and gone into in detail. Technicalities of the court and police procedure will be studied so that the policemen on the beat will know just what evidence he will require, how he must prepare and present it; how juries are chosen and under what laws they operate. They will also be taught the proper way of filing charges. A scientific study of criminology will be taken up and the psychological and physical causes of the commission of

crimes will be gone into. Practically all different phases of the study will be given by experts in the special lines. The schools will be conducted under the direct management of city manager Reed and his assistant, Paul Eliel.

Village Hall and Fire Apparatus Destroyed by Blaze.

Canastota, N. Y.—The Canastota village hall, a three-story brick structure erected in 1905 and valued at about \$20,000, was completely destroyed by fire of unknown origin. The village fire apparatus, consisting of steamer, chemical wagon, hook and ladder truck, hose, etc., was kept in the building. It was possible to get a portion of the hose out, with which the firemen fought the blaze valiantly, saving surrounding buildings. The combination chemical and hose truck stood near the door, but firemen were driven back by the flames before they could haul it out and one was seriously burned.

Ignorance of Alarm Results in Big Fire.

San Francisco, Cal.—A \$250,000 fire destroyed the plant of the Pacific box factory here. The complete destruction of the plant was due, according to the fire department, to the failure of the watchman to turn in an alarm. The plant was well equipped with alarm boxes. The watchman broke the glass of each box in the place but failed to pull the string and the blaze had announced itself in the sky before the department got into action.

Business Section Threatened by Fire.

Davis, Cal.—Fire, which threatened to destroy the entire business section of Davis, started in the rear of a pool hall and resulted in damages estimated at \$100,000. Half of the loss is covered by insurance. Starting at the principal street of the town, the flames, fanned by a stiff north wind, swept south, razing the one and two-story buildings in quick succession until two-thirds of the block had been consumed. Lack of fire-fighting facilities handicapped volunteering Farm School students and residents of the town in combating the flames. The town supply of water gave out shortly after the fire started and it was necessary to secure additional water from a 65,000-gallon fire-tank car rushed over from Sacramento from the Southern Pacific Company. Two chemical engines were sent over from Sacramento. After exhausting their supplies of chemicals the tanks were filled with water from buckets. The Yolo Causeway proved of value for the unexpected purpose of rushing fire equipment from Sacramento. The auto equipment made the trip at the rate of fifty miles an hour.

City Sues on Police Phone Contract.

St. Louis, Mo.—City counselor Daues has announced that, at the request of George McD. Johns, superintendent of the city police and fire alarm telegraphs, he is filing a mandamus suit to try to compel the board of police commissioners to terminate its present contracts with the Kinloch Telephone Company, under which the 571 police telephone and flash signals are operated. The city pays the Kinloch company \$3,222 a year for this service under a contract that was entered into May 25, 1910, to run five years, with a provision that the contract so far as it applied to any particular station would be automatically renewed for a year at its expiration unless the city had given thirty days' notice of intention to discontinue the service. Under this provision the contract is still in force, the time of expiration varying according to the intervals at which the various stations were turned over the city. The police board, on August 18 last, when Sam B. McPheeters was president and Thomas S. Maffit was a member, voted to cancel the contract. Before another meeting was held McPheeters was removed and Maffit resigned. The new board, with Walter D. Thompson, a director in the Kinloch Long Distance Telephone Company, as president in McPheeters' place, and Henry C. Ostertag in Maffit's place, refused to approve the action of the old board, leaving the Kinloch contracts still in force. Eighteen months ago McPheeters and Maffit, as members of the police board, had asked the city to take steps to install its own police telephone and signal system and \$9,320 was appropriated for

that purpose. With this money and \$400 left over from another fund, 43 stations were installed. The city had planned to spend \$16,700 to put in a new system throughout. Daues said he would contend that the board of police commissioners has no right to contract with private parties for service which is being provided by the city.

GOVERNMENT AND FINANCE

City Manager Plan Defeated.

Berkeley, Cal.—The city manager plan embodied in amendment 1 was defeated by more than 500 votes—in 69 out of 71 precincts, the vote was 6,718 to 7,213. Early returns indicated that the amendment had carried, but the western and southern portions of the city offset the majority given for the measure in east and central Berkeley. The large vote accorded to the amendment caused surprise to the supporters of the issue, as no active campaign had been waged for its adoption. An amendment providing for pensions to firemen and policemen was defeated.

Begin on New Accounting System.

San Jose, Cal.—Beginning a complete reorganization of the accounting system of the city, Mr. Davis, of the firm of Haskins & Sells, has started a preliminary survey of all municipal departments. Mr. Davis is senior accountant of the San Francisco branch of the accounting firm. He will have associated with him one of the junior accountants of the firm, will consult with other officers and experts of the firm, and will be in constant consultation with city manager Reed, assistant manager Paul Eliel and city auditor Roy Walter. The accounting system will be devised to meet the special requirements of the city of San Jose and will be so constructed as to give detailed information at any time of all departments of the city. The preliminary survey will be made and a verification audit of the city books to December 1. Following that the books will be set up and the firm will carry the accounts for about one month until the city forces have been thoroughly broken in to their use and operation. On January 1 or 2 the first balance sheet ever issued by the city of San Jose will be completed and will show the exact condition of the city finances. Through this and the accounts back of it, any and all transactions may be traced accurately and with a minimum time requirement.

Commission Form Wins.

Butler, Pa.—The new commission government charter was approved at the recent election by a big majority. The first election under the new charter will be held November, 1917, when a mayor at a salary of \$1,200 and four other commissioners at salaries of \$750 will be elected at large. Candidates are nominated by a petition signed by 25 voters. The mayor is the superintendent of the department of public affairs, while the four councilmen will each have one of the following departments to handle, as they may elect upon organization: Department of accounts and finance; department of public safety; department of streets and public improvements, and department of parks and public property. Under the new system the commissioners will appoint the following salaried officials: City treasurer, city clerk, city solicitor, city engineer and city assessor. Under the old system operating now here are six salaried officials, as follows: City treasurer, city clerk, city solicitor, city engineer, superintendent of public works and street commissioner.

The San Francisco Bureau of Governmental Research.

San Francisco, Cal.—Following the survey made recently by the New York Bureau of Municipal Research, the tax committee decided to establish in San Francisco a bureau of governmental research, to study facts, get into close touch with the business of the city and work with its officials for civic improvement, standing for the post-election interests of citizens in the efficient management of their government. With the approval of the San Francisco Real Estate Board, a number of property owners and

others interested in good municipal government were consulted. The following trustees for organization were selected: John S. Drum, William H. Crocker, James K. Lynch, F. S. Moody and Bruce Cornwall, with the cooperation of Samuel G. Buckbee, Dudley Cates, Colbert Coldwell, James J. Fagan, Herbert Fleishhacker, George H. Lent, William A. Magee, A. Schilling, James E. Walsh and George Whittell. The work of financing the bureau for five years with an annual appropriation of \$20,000 has been undertaken by those interested and the incorporation of the bureau arranged for. The bureau will have a paid force, consisting of a specially trained and experienced director and efficient assistants, whose business it will be to keep in touch with all the activities of the departments of the city government during each day of the year. Work is to begin at once. Some of the departments and officials have already adopted recommendations made by the surveyors. The Board of Fire Commissioners have put into force two of the recommendations in the survey, thus saving the city nearly \$12,000 a year, or more than the cost of the survey.

STREET CLEANING AND REFUSE DISPOSAL

Garbage Plant Bond Issue Defeated.

Chicago, Ill.—The proposal to issue \$2,000,000 in bonds to pay for the installation of a garbage disposal system was defeated by a big majority. The City Club and the women's organizations waged a vigorous campaign against the issue because the question had not been given adequate expert consideration and they therefore considered the expenditure at this time unwise.

Want City Garbage Plant for Capital.

Washington, D. C.—The annual report of the street cleaning department just made public, states that during the past fiscal year there were employed an average daily force of 600 men and 200 vehicles. The report makes a strong plea for the establishment of a municipal garbage plant, an item for this improvement being included in the commissioners' estimates which will go to congress in December. It refers to the investigation made to determine the practicability of establishing such a plant and estimated profits which indicate that at the end of thirteen years the plant, costing \$885,900, would have paid for itself and still be in good condition. The report states that there has been no increase in the unit costs of cleaning the capital's streets and that the costs compare favorably with those of former years.

Research Bureau Criticises Street Cleaning Methods.

San Francisco, Cal.—Reductions in the cost of flushing streets in San Francisco, declared to be approximately 183 per cent more per 1,000 square yards than in Chicago, is the chief recommendation in the report of the survey of the New York bureau of municipal research dealing with streets. Among other recommendations the report advocates that street sweepers be "dressed up" and instructed through a manual; that the board of public works engage in a campaign for an annual "clean-up week," and that the present bureau of street cleaning be organized into a bureau of street cleaning and sanitation, to include the supervision of garbage collection and disposal. Other recommendations are: That the practice of paying 25 cents and 30 cents a load for the privilege of dumping be stopped, and that special efforts be made to secure free dumps, and, if possible, a revenue from the material dumped; that an effective street cleaning ordinance be drafted; that a railway car-flusher machine be constructed or purchased and operated over the lines of the Municipal Railway; that pick-up brooms be used to support the work of the side-stroke machine broom battery, and that flushers be operated in batteries at night and the use of flushers as gutter sprinklers be abandoned; that the number of hand-cleaning gangs be reduced and that the working force be organized under a small number of larger groups, with better supervision; that the type of street waste cans be changed. The report

recommends that the bureau of streets be abolished and the sub-functional activities now within the jurisdiction of this bureau be assigned to a new bureau to be known as the "bureau of highways," which shall have jurisdiction over the care and construction of streets and sidewalks and maintenance of bridges. Organization of the bureau of sewer cleaning and repair into a "bureau of sewers," to include construction, maintenance and cleaning of sewers, and the construction of side sewers, is also advocated in the report, together with decreased overhead inspection cost, charging of a fee for sub-sidewalk space privately occupied and the abolition of "team boss."

TRAFFIC AND TRANSPORTATION

Safety on Draw Bridges.

Boston, Mass.—An engineer of the public works department has submitted a plan to Mayor Curley, which, he claims, would make practically impossible an accident like that in which an elevated car plunged into Fort Point Channel from the Summer street bridge killing 45. The plan is that of heavy gates, which as they close, touch a spring releasing electric current for danger signals. Numerous plans have been submitted since the accident, most of them impractical. The mayor has asked the engineers of the public works department, the Boston Elevated Company and the Institute of Technology to co-operate with him in devising a scheme for safeguarding all drawbridges in the city.

Chicago, Ill.—Commissioner of public works William R. Moorhouse is prepared to test a new barrier gate guaranteed to stop any automobile at any speed and which he intends to try at the Lake street bridge. The gate is so constructed that an automobile crashing through the first or guard gate will strike a sixteen-inch boom and slide it against a friction resistance for such a distance as either to stop the machine or, if the speed of the machine is unreasonable, wreck it beyond repair.

Strict Law May Force Jitneys Out.

Huntington, Ind.—It is expected that the city ordinance requiring a bond of \$2,000 for jitney bus operators will practically put this kind of transportation out of business. The bond required by the ordinance was designed by the council to protect the persons riding in jitney busses, in case they were injured and brought suit for damages. Bonding companies say such a bond is very hazardous, and the result is that such a bond costs between \$300 and \$400, in many cases about as much as the original cost of the auto. The ordinance requires a license of \$5 a year for a five-passenger automobile used in the jitney bus business, and an additional \$3 a year for each passenger carried above that number. The cross-country busses are not required to file a bond, but the owners will be obliged to take out a license.

Standards of Adequate Car Service.

Washington, D. C.—"A seat for every passenger during non-rush periods, and seven square feet of floor space for every standing passenger during rush periods," the standard of street car service for the District of Columbia, as adopted by the public utilities commission, has gone into effect. Non-rush traffic is described as existing from 9:15 a.m. to 3:45 p.m. and from 6:30 p.m. to 10:45 p.m. in mid-week days and from 9:15 a.m. to noon and from 6:30 to 10:45 p.m. on Saturdays. Rush periods are defined as existing from 6:30 a.m. to 9:15 a.m. on midweek days and Saturdays, and from 3:45 p.m. to 6:30 p.m. on midweek days. Midweek days are from Monday to Friday, inclusive, legal holidays excepted. The railway companies are required to make such observations as will keep them in touch with the demand for service and to make a traffic report to the commission. The bureau of transit and equipment inspection of the commission will make inspections in order to see that the law is observed. Following the order of the commission, issued several months ago, that the railway companies would be expected to put the standard into effect November 1, the Washington Railway and Electric

Company notified the commission of its intention to appeal to the courts unless the order was reconsidered. The notification by the railway company set forth that the rules are "impractical, unreasonable, uncertain, vague, indefinite, incapable of enforcement and invalid." As yet neither company has taken the matter into court. The rules of the commission were issued, it was explained, not to improve the street car service in the District as a whole, at this time, but to standardize it on the basis of what is now the average service maintained, and, in that way, to improve the service on lines where it has been bad. At the time the rules were issued, it is stated, the commission admitted its inability to devise any scheme whereby passengers would be prevented from crowding on cars or carrying their maximum number, as prescribed by the order, but explained that, by requiring a sufficient number of cars in the rush hours, it would then be up to the public to decide whether or not it would enjoy the benefits. The law provides a fine of \$200 for each offense of violation of the regulations.

MISCELLANEOUS

City Buys Amusement Park.

Ogden, Utah.—Glenwood park, an Ogden resort that had difficulties under private ownership, has come into the possession of Ogden city and in the future will be maintained as a municipal pleasure ground. The fifteen acres of grove and ball park, together with the buildings on the tract, were exchanged for three parcels of city property, hospital and fire house sites and forty acres near the Country club. Purchase of Glenwood park and adjoining tracts, the city commissioners say, will supply the demand for a playground and park in the third municipal ward. In addition, they say, the park can be converted into a recreation ground for the entire city. It is proposed to repair the buildings, install playground apparatus and construct a swimming pool in the river for men, women and children. The park will come under the jurisdiction of the department of parks and public property and it will receive the same attention that other city parks receive. By next summer the commissioners hope to have it in good condition for the public.

Contracts Let Without Bids Illegal.

Pottsville, Pa.—The court has decided that five contracts let by council for remodeling city hall are illegal. The work has already been completed, and court indicated that it will grant an injunction to prevent the paying of the bills. The objection to the action of council is that the contracts were let without advertising for bids. The case will be appealed to the supreme court, as every such city in the state is affected by the result.

Flood Control and Water Conservation.

Harrisburg, Pa.—Dr. Samuel G. Dixon, state commissioner of health, chairman of the conference on flood control and water conservation held at the Capitol at the invitation of governor Brumbaugh, was authorized to appoint a committee to draft legislation in collaboration with the State Water Supply Commission. This committee will prepare bills embodying ideas advanced for regulation of waters of the commonwealth by the commission and report to another session to be held here by the conference just before the meeting of the general assembly. Governor Brumbaugh, who made the opening address, urged that provision be made not only for prevention of floods, but for impounding of waters so that there could be a regular supply for industrial and domestic purposes as well as for agriculture in case irrigation should ever become necessary. The governor also suggested state control so that in time to come the water power would belong to the commonwealth. Morris Knowles, Pittsburgh flood commissioner; Col. Edgar Jadwin, United States engineer; Frank Sutton, United States Geological Survey; forestry commissioner Conklin, water supply commissioner Zentmyer, public service commissioner Magee and others discussed the problems, reservoirs, flow regulators and extensive reforestation being suggested as well as continuation of the inventory of the water resources of the state. Commissioner Magee said that the federal government and neighboring states should help in working out the projects.

LEGAL NOTES

A Summary and Notes of Recent Decisions— Rulings of Interest to Municipalities

Removal of Police Officer—Fraud—Grounds.

Glenn v. Park et al.—Fraud, inducing plaintiff to resign as a policeman, is not ground for his reinstatement, where defendants, city officers, had power to remove him without resignation.—Supreme Court of Utah, 158 P. R., 425.

Contracts—Modification—Statute

Geary v. Board of Commissioners of Port of New Orleans.—In directing the contractor for a wharf not to construct the outer part, the Board of Commissioners were not acting under Civ. Code, art 2765, providing that the proprietor can cancel the bargain he has made, though the work has already been commenced, by paying for expenses and labor incurred, and such damages as may be required, the right conferred by the article being to cancel and not to modify the contract.—Supreme Court of Louisiana, 72 S. R., 245.

Charter—Construction—Constitutional Provisions.

City of San Antonio v. Johnson.—Charter of San Antonio, § 123, providing that all taxes delinquent for ten years before any suit is filed to collect the same shall be barred by limitation, is not violative of Const. art. 3, §55, providing that the Legislature shall have no power to release or extinguish, in whole or in part, any indebtedness, liability, or obligation to the state, or any county or other municipal corporation, since the word "barred" does not mean released or extinguished, but is a plea or peremptory exception of a defendant to destroy the plaintiff's action; an impediment, obstacle, or preventive barrier.—Court of Civil Appeals of Texas, San Antonio, 186 S. W. R., 866.

Care of Streets—Liability of City.

Briglia v. City of St. Paul.—It is the duty of a city to use ordinary care to keep its streets in safe condition for travel. The city is not, as a rule, bound to make safe for travel the area outside of a public street, nor to erect barriers to prevent travelers from straying off the street to adjoining land upon which there may be dangerous places. The city is bound to provide such guards only where the street itself is unsafe for travel by reason of the close proximity of excavations, embankments and the like.—Supreme Court of Minnesota, 158 N. W. R., 794.

Officers—Assistants—Power of Appointment.

Byrne v. Raymond, Mayor.—Under P. L. 1907, p. 34, authorizing city clerks in cities of the first class with the consent of the common council to appoint clerks and assistants, such appointments are valid without the consent of the mayor; section 21 of the city charter of Newark (P. L. 1857, p. 128), requiring appointments to be made by a majority of the whole council, and section 30, requiring the approval of the mayor to all resolutions, being inapplicable.—Supreme Court of New Jersey, 97 A. R., 773.

Taxation—Assessment.

Graham v. City of West Tampa.—The Constitution ordains that the Legislature shall provide for a uniform and equal rate of taxation, and shall prescribe such regulations as shall secure a just valuation of all property, both real and personal, that is subject to taxation, that all property shall be taxed upon the principles established for state taxation, but cities and towns shall make their own assessments for municipal purposes, and, when general statistics provide regulation by which just valuations and uniform and equal taxation may be attained, it is not essential that such regulations be incorporated in the charter of a city which has the powers conferred upon municipalities by the general laws, and under a power to tax such city may prescribe appropriate regulations to secure just valuations and a uniform and equal rate of taxation.—Supreme Court of Florida, 71 S. R., 926.

NEWS OF THE SOCIETIES

Calendar of Meetings.

Nov. 23, 24.—CIVIC SECRETARIES' CONFERENCE. Annual conference, Springfield, Mass. Secretary, Howell Hart, Milwaukee, Wis.

Nov. 23-24.—MASSACHUSETTS FEDERATION OF PLANNING BOARDS. Annual convention, Springfield, Mass. Secretary, Arthur C. Comey, Cambridge, Mass.

Nov. 23-25.—NATIONAL MUNICIPAL LEAGUE. Annual convention, Springfield, Mass. Secretary, Clinton Rogers Woodruff, 705 North American Building, Philadelphia, Pa.

Dec. 5.—NATIONAL CIVIL SERVICE REFORM LEAGUE. Annual meeting, New Haven, Conn. Secretary, George T. Keyes, 79 Wall Street, New York City.

Dec. 5, 6.—PAVING BRICK INSTITUTE. Meeting, Statler Hotel, Cleveland, O. Secretary, Will P. Blair, Brotherhood of Locomotive Engineers Bldg., Cleveland, O.

Dec. 5-7.—AMERICAN ASSOCIATION OF STATE HIGHWAY OFFICIALS. Annual meeting, St. Louis, Mo. Secretary, Joseph Hyde Pratt, Chapel Hill, N. C.

Dec. 5-8.—AMERICAN SOCIETY OF MECHANICAL ENGINEERS. Annual meeting, New York, N. Y. Secretary, Calvin W. Rice, 29 West 39th Street, New York.

Dec. 7-9.—SAFETY FIRST FEDERATION OF AMERICA. Annual convention, Baltimore, Md. Executive Secretary, W. D. Heydecker, 6 East 39th Street, New York City.

Dec. 11-13.—PORTLAND CEMENT ASSOCIATION. Annual meeting, New York City. Assistant to General Manager, A. H. Ogle, Chicago, Ill.

Dec. 26-28.—SOCIETY OF AMERICAN BACTERIOLOGISTS. Annual meeting, New Haven, Conn. Secretary, Dr. A. Parker Hitchens, Glenolden, Pa.

Dec. 27-30.—AMERICAN ECONOMIC ASSOCIATION. Annual meeting, Columbus, Ohio. Secretary, A. A. Young, Ithaca, N. Y.

Dec. 27-30.—AMERICAN STATISTICAL ASSOCIATION. Annual meeting, Columbus, O. Secretary, Carroll W. Doten, 491 Boylston street, Boston, Mass.

Dec. 26-31.—AMERICAN ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE. Annual meeting, New York City. Secretary, L. O. Howard, Smithsonian Institute, Washington, D. C.

Dec. 28-31.—AMERICAN POLITICAL SCIENCE ASSOCIATION. Annual meeting, Cincinnati, O. Secretary, Chester Lloyd Jones, University of Wisconsin, Madison, Wis.

Jan. 20, 1917.—WESTERN PAVING BRICK MANUFACTURERS' ASSOCIATION. Kansas City, Mo. Secretary, G. W. Thurston, 416 Dwight Bldg., Kansas City, Mo.

Jan. 23-25, 1917.—AMERICAN WOOD PRESERVERS' ASSOCIATION. Annual meeting, New York City. Secretary, F. J. Angler, B. & O. Mt. Royal Sta., Baltimore, Md.

Feb. 5-12, 1917.—AMERICAN ROAD BUILDERS' ASSOCIATION. Seventh American Good Roads Congress and Eighth National Good Roads Show, Mechanics' Hall, Boston, Mass. Secretary, E. L. Powers, 150 Nassau street, New York City.

Feb. 7-15, 1917.—TENTH CHICAGO CEMENT SHOW. Coliseum, Chicago, Ill. Secretary, Blaine S. Smith, 210 South La Salle Street, Chicago.

Feb. 8-10, 1917.—AMERICAN CONCRETE INSTITUTE. Hotel La Salle, Chicago, Ill. Secretary, Harold D. Hynds, 1418 Walnut Street, Philadelphia, Pa.

Feb. 19-24, 1917.—SOUTHWESTERN CONCRETE ASSOCIATION. Annual meeting and concrete show, Convention Hall, Kansas City, Mo. Chairman, Show Committee, Chas. A. Stevenson, 1433 West 10th Street, Kansas City, Mo.

National Municipal League.

The National Municipal League is to hold its annual meeting in Springfield, Mass., during the "Municipal Week," on November 23, 24 and 25. The program follows:

Thursday, 10.30. Meeting of Council, National Municipal League.—Conference of delegates from state municipal leagues. Conference of directors of bureaus. Conference of directors of bureaus of municipal research.

12.30. Luncheon with city managers.—Lawson Purdy, Esq., New York, president, National Municipal League, presiding. "The Most Important Accomplishment of My City in 1916." (Roll call and three-minute speeches by city managers and delegates.)

2.30. Opening Session.—Vice-president, Robert Treat Paine, Boston, in chair. Address of welcome, Hon. Frank E. Stacy, mayor of Springfield.

Response and Annual Address—"Some Advance Municipal Steps," Lawson Purdy, New York city, president, National Municipal League.

Annual Review—"Municipal Preparedness," Clinton Rogers Woodruff, Philadelphia, secretary, National Municipal League.

6.00. Group Dinners—Civic secretaries; bureaus of municipal research.

8.00. General Session—General subject: "Political Parties in City Government: A Reconsideration of Old Viewpoints." President Lawson Purdy presiding.

"The Place of Political Parties in Municipal Government"—Charles A. Beard, associate professor of politics, Columbia University.

"The Elimination of Political Parties in Canadian Cities"—W. D. Lightall, K. C., Montreal, honorary secretary, Union of Canadian Municipalities.

"Municipal Non-partisanship in the Light of New York Experience"—John J. Murphy, New York city, tenement house commissioner.

"State Politics and Municipal Legislation"—Governor Charles S. Whitman, New York.

10.00. Smoker (close of session), given by the Springfield Board of Trade to the National Municipal League, guests and delegates. Robert S. Binkerd, New York City Club, in charge.

Friday, 10.00. The annual meeting, President Lawson Purdy in the chair. Reports of treasurer, George Burnham, Jr., Philadelphia; council, M. N. Baker, Montclair, N. J.; nomination committee, R. V. Ingersoll, Brooklyn, N. Y. Election of officers.

10.30. General session—Reports of committees:

"The Relation of the City to Its Food Supply"—Prof. Clyde L. King, Philadelphia, chairman.

"Municipal Courts"—Hon. Harry Olson, Chicago, chairman; Herbert Harley, Esq., Chicago, secretary.

Committee on Civic Bibliography—

Miss Adelaide R. Hasse, New York, chairman.

"New Sources of Municipal Revenue"—Prof. Robert M. Haig, Columbia University, chairman.

Committee on Franchises—Dr. Delos F. Wilcox, New York, chairman.

(Each report to be followed by opportunity for brief discussion.)

12.30. Luncheon. Subject: "Co-ordination or Amalgamation of Civic Forces"—Lucius E. Wilson, toastmaster.

"A Plan of Amalgamation"—H. S. Gilbertson, New York.

"The Need of Co-ordination and Amalgamation"—Raymond B. Fosdick, New York city.

Discussion (three-minute speeches by delegates.)

2.30. General Session—Subject: "Problems in City Planning." George B. Ford, New York, in chair.

"City Planning and Political Areas"—George E. Hooker, secretary, City Club Chicago.

"How Not to Plan Cities"—J. Horace McFarland, Harrisburg, president, American Civic Association.

"Methods of Financing City Planning Projects"—Nelson P. Lewis, New York.

"Progress of District Planning in New York City"—Robert H. Whitten, secretary, district commission, New York.

Discussion—"What We Have Accomplished in City Planning"—Opened by George B. Ford, New York.

(Three-minute reports from cities—large and small.)

4.00. Reception and tea to delegates' wives—Springfield Women's Club. Mrs. A. A. Packard, president, in charge.

6.00. Group dinners.

8.00. General Session—General subject: "Extension of Municipal Activities and Municipal Expenditures"—Hon. Charles J. Bonaparte, Baltimore, presiding.

"The City's Responsibility to Its Needy: A City Department to Fight Poverty"—Mrs. Mary K. Simkovich, New York.

"Private and Public Welfare Activities"—Allen T. Burns, Cleveland.

"The Extension of Municipal Activities and Its Effect on Municipal Expenditures"—Hon. William M. Prendergast, New York city.

10.00. Smoker at Colony Club—Joseph C. Allen, chairman of committee on arrangements, in charge.

Saturday—Subject: "Practical Operation of Various Forms of City Government"—Henry M. Waite, Dayton, Ohio, presiding.

"Evolution of Types of Municipal Government in the United States"—Prof. Howard L. McBain, Dorman B. Eatons professor of municipal government, Columbia University.

"Recent Changes in Town Government"—Prof. E. A. Cottrell, Wellesley, Mass.

"The Dayton Plan in Operation"—J. M. Switzer, city commissioner, Dayton, Ohio.

"Some Observations on the Progress of the City Manager Plan"—Richard S. Childs, vice-president, National Municipal League.

Discussion—"Governmental Difficulties in Cities."

"The Buffalo Charter"—Melvin P. Porter.

In Pittsburgh—A. Leo Weil.

In Alameda—William J. Locke, assistant secretary, League of California Municipalities.

"The New Orleans Charter"—(Letter from Miss Ethel Hutson).

In Sandusky—"Troubles with City Manager Form"—K. B. Ward.

Discussion on "Results of Non-Partisan Elections."

Under the Boston Charter—R. J. Bottomly.

Under the Cleveland Charter—A. R. Hatton.

12.30. Luncheon—Toastmaster, vice-president Richard S. Childs. Subject: "The National Municipal League: Its Works and Activities—How to Improve Them."

(Three-minute talks by delegates.)

American Road Builders' Association.

The fourteenth annual convention of the American Road Builders' Association will be held in Mechanics' Building, Boston, Mass., during the week beginning February 5, 1917. The program, which is in course of preparation, will include papers and discussions on subjects connected with road and

bridge building and street paving by the foremost authorities of the United States and Canada.

In connection with the convention, and in the same building, will be held the Eight National Good Roads Show. This exposition will include exhibits by leading manufacturers in the United States of the machinery and materials used in road and paving construction and maintenance.

This exhibition, which has been a feature of the American Road Builders' Association conventions for a number of years, has increased in size and interest year after year. The coming exhibition takes on added importance on account of the enormous sum of money appropriated under the recently enacted Federal Aid Law and the additional large sums to be expended for road building by the various states and smaller units of government.

Mechanics' Building, in which the convention and Good Roads Show will be held, is admirably situated and fully equipped for the purpose. It is located on Huntington avenue, within convenient distance of the leading hotels and business districts of Boston. The building is well lighted and heated, and is thoroughly modern in its appointments. It contains ample space for practically any number of exhibits, and is adaptable to exhibits of any size, as the floor plans just published indicate.

The management announces that the

services of Mr. H. G. McConaughy have been secured as director of exhibits. Mr. McConaughy has had many years' experience in this line of work and is well known in connection with the management of the exhibitions held under the auspices of the American Electric Railway Manufacturers' Association.

Lincoln Highway Association.

The annual meeting of the directors of the Lincoln Highway Association was held at Detroit, Mich., November 9th. The meeting brought together some of the men most prominent in the automobile industry of the country. A deep personal interest on the part of each in the present development and future importance of the Lincoln Highway.

(Continued on page 660.)

PERSONALS

Knofflock, George, chief of the Mansfield, O., fire department, treasurer of the International Association of Fire Engineers, and considered the oldest fireman in the United States in years of service, died at his home Nov. 14 after a short illness. He entered the Fire Department service as a volunteer in 1861.

Moore, John Robert, a civil engineer, who was for many years connected with the New Jersey Central Railroad, died Nov. 16 at his home in Merrick, L. I. He graduated at Norwich University, and was for the last twenty-five years with the Department of Highways, New York city, as one of the city's staff of civil engineers.

Newett, Robert B., chief of police of Torrington, Conn., died Nov. 6 at that city. Mr. Newett had been ill for some time and had only recently returned to his office.

Doane, T. O., after serving 51 years, 30 years as chief, with the Plainfield, N. J., fire department, has resigned.

Doherty, D. Frank, city purchasing agent of Boston, Mass., has resigned. Patrick O'Hearn has been appointed to succeed Mr. Doherty.

Foreman, A. E., has resigned as assistant city engineer of Victoria, B. C. Much work has been done under his charge since he took office in 1912. He organized a cost data system in the management of many public works and developed novel methods in difficult sewer construction.

Merkle, Dr. Louis, has been appointed city bacteriologist of Cincinnati, O.

Miller, Guy H., of Watertown, who was graduated from Union College, course of engineering, in the class of 1894, has been appointed senior highway engineer in the Bureau of Public Roads, Federal Department of Agriculture. Mr. Miller has been engaged in state work since he was graduated, his last position being in the Highway Department. In 1915 he resigned from the state service and became a road contractor.

PROBLEMS CITIES ARE STUDYING WITH EXPERTS

Altoona, Kans., in making ELECTRIC LIGHT PLANT and WATERWORKS improvements, employed as engineers Riley & Hardman, Parsons, Kans.

Crosby, N. D., is to extend its sanitary SEWER SYSTEM and plans have been drawn up for the work by E. J. Thomas, consulting engineer, Minot, N. D.

The village of Bexley, O., is to construct a SEWER SYSTEM and make STREET IMPROVEMENTS from plans prepared by Jennings, Lawrence and Lindsay, 509 Hartman Building, Columbus, O.

Madison, Wis., is improving its WATER WORKS by enlarging the pumping station and increasing the equipment. Plans and specifications for the improvement were the work of local consulting engineers, Meade and Seastone.

In building a SEWAGE DISPOSAL PLANT, Lebanon, Pa., retained as designing and consulting engineer, James H. Fuertes, 140 Nassau Street, New York, N. Y.

In making a number of STREET IMPROVEMENTS, Euclid, O., had the engineering services of F. A. Pease Engineering Company, Marshall Building, Cleveland, O.

In improving the electric LIGHT PLANT, Hays, Kans., has the consulting engineering services of Henrici, Kent and Lowry, 222 Commerce Building, Kansas City, Mo.

Beggs, Okla., and Wilburton, Okla., are to improve their WATER WORKS and SEWERAGE SYSTEMS from plans and specifications prepared by Mackintosh-Walton Engineering Company, 1023 State National Bank Building, Oklahoma City, Okla.

Before proceeding with the construction of a municipal WATER WORKS system, Vinton, La., has retained T. H. Mandell, Lake Charles, La., as consulting engineer to investigate conditions in the city.

In constructing a BRIDGE, the city of Salem, Mass., retained as consulting engineer J. R. Worcester & Co., 79 Milk Street, Boston, Mass.

Rockwell, Ia., is to construct a SEWAGE DISPOSAL PLANT, J. Harley Mayne, 235 Merriam Building, Council Bluffs, Ia., prepared the plans.

Erie, Pa., is now receiving proposals for its extensive Mill Creek FLOOD PREVENTION improvements, which are to cost \$850,000. Farley Gannett, Harrisburg, Pa., consulting engineer, has completed the plans for the project.

NEW APPLIANCES

Describing New Machinery, Apparatus, Materials and Methods and Recent Interesting Installations.

STEEL SHEET PILES.

Slip Joint and Spring Lock Types in Many Designs.

Steel sheet piling is coming into increasing use in all kinds of construction work, particularly in municipal jobs such as cofferdams or water main and sewer trenches or similar excavation in soft, wet ground, sand or unstable soil or excavation below water level. The advantages of steel piles are lightness, stiffness, strength, water-tight joints and rapidity in driving. These desirable features are emphasized in the Slip Joint and Spring Lock piles and developed in a number of useful designs for various types of construction.

The simplest form of Spring Lock sheet pile is a regular unit with a thin, flat web having one male and one female flange. These engage to make the Spring Lock joint that consists essentially of a bent flange between another bent flange and a cover piece. The male flange is generally made slightly wider than the female flange so that in engagement it interferes and must be forced into position. This causes the projecting edge of the web to spring a little out of its original plane and insures a positive spring tight contact along the joint line. If the male flange is made with only a single bend of about 45 degrees with the web, a joint may be made by a transverse and twisting motion. This side entrance joint is a unique, important and very convenient feature.

For very hard driving through obstructions or where heavy sections are required, special curved rolled bars for the joint flanges may be used. In these three lines of spring contacts are developed, as shown in the illustration. The joint-bars can be rolled to any length and of thicknesses from one-fourth to one-half inch. They can be riveted to any bar, plate or shape desired. Rib units and hollow pile units may be used as in the other type. Curved units may be made up into conduits, pipes, cofferdams, caissons or arched sheeting.

The principal claims made for these piles include the positive efficiency of the interlocking method of the side entrance joint and its water-tightness in clear water. The metal in the joint is designed to give greatest strength.

Every pile can be accurately proportioned and the width of web and flange and thickness of web can be varied to serve under the exact conditions specified. There are light piles for light service and moderate weight piles for very heavy service. Light weight hollow piles are stiff and durable and may be filled with concrete to give a strong and permanent construction at low cost. Cylinders, pipes and walls can be built up of curved units.

The piles can be assembled without headroom clearance. The lightest units can be installed with patent driving bars and in the hardest driving the piles are protected by a special system of driving bars. These can be provided with cutting edges to penetrate and displace obstructions and sever logs and timbers without injury to the piles. A special system provides for installation of light units of great width so that the number of joints and the cost are reduced. Driving is rapid and economical and no derricks are required for handling the piles in the field.

The sheeting is designed and made with weights only fifteen to fifty per cent. those of rolled sections and freight charges are correspondingly less.

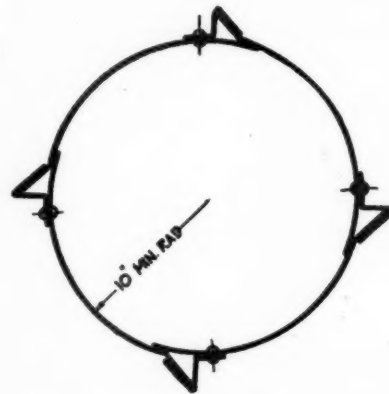
Each Slip Joint pile unit is fabricated by bending or pressing a single com-

mercial sheet or plate, the manufacturing process involving no riveting, welding or forging, so that strength is increased and possibility of flaws eliminated. The piles have straight or curved webs with double flanges of U-shaped cross-sections at right angles to the web, this design utilizing the joint material for increasing the bending strength. The flanges are made of uniform size and provide an interlock that gives adequate clearance without permitting leakage of sand or earth. They quickly silt up to make a water-tight joint. The different shapes may be combined to form any type of structure under any conditions of driving and splicing. The weight of the standard joints is only 2.7 to 9.2 pounds per square foot. Rib units may be used where great bending strength is needed.

Plain units are simply flanged sheets without provisions for pulling or special driving. The lightest units are installed in very soft mud, used for facing an excavation or installed in sand or loam with a water jet. Heavier units are made for heavier driving. A driving head or bar is used for hard driving and the upper end of the web bent double to form a lip to reinforce it against impact. All these piles, even the lightest, can be driven in hard ground if the lower end is bent double to form a hook, and a driving bar is provided to engage it. Light piles may be spliced by permanent wooden driving bars. Hollow Slip Joints are made by the combination of curved sheets with regular units. Cast-in-place concrete sheet piles are made by driving regular standard piles and narrow flanged slip joint piles alternately and installing a flat cover plate with each pile unit—filling with concrete.

Convenient waterproof, fireproof, verminproof A-tents and buildings can be made from Slip Joint pile combinations very quickly and economically. These are very useful for storing cement or other materials and machinery and are very handy for shelter houses and quarters for construction gangs.

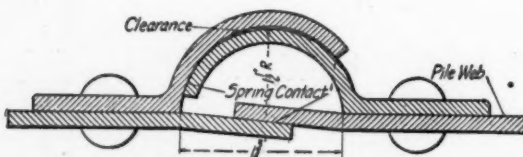
These piles have been used in very difficult construction work, particularly in the New York subways. The accompanying illustrations indicate the principles of design and the types of shapes and possible uses. The piles are made by the Ransome Concrete Machinery Company, Dunellen, N. J.



Cylindrical Cofferdam, Caisson, or Pipe

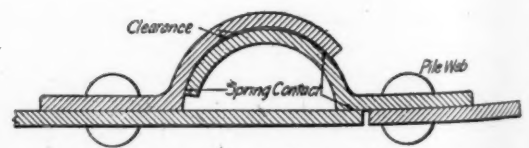


Spring Lock Joint



Water-tight Slip Joint Spring Lock Rolled Joint Bars

SPRING
LOCK
JOINT
PILES.



Water-tight Flush Joint Spring Lock Rolled Joint Bars

TOWER TRUCK.

With Power - Operated Telescopic Platform.

There is a wide variety of uses for a truck like the one shown in the illustrations on page 660. It can be used by public works departments in such work as inspecting, repairing, cleaning and trimming street and park lamps and setting up standards. Public service corporations use them in handling line equipment and street railway wires. Park departments and officials in charge of street trees put this type of truck in service for spraying, trimming and treating trees.

The truck shown is operated by the South Park Commission, Chicago, Ill., and is used by the lighting department. The tower is raised and lowered on the four supports by means of the pressure tank. The tank is kept filled by the motor's power. The truck is an M-15 G.M.C. made by General Motors Truck Company, Pontiac, Mich.

INDUSTRIAL NEWS

Cast Iron Pipe.—Chicago—A sharp advance of \$3 per ton in the price of cast iron pipe has been announced here. New business includes inquiries for 300 tons at Winnipeg, Can., and 1,500 tons at Duluth. Quotations: 4-inch, \$38.50; 6-inch and larger, \$35.50; class A, \$1 extra. Birmingham:—Very little new business has been received, although several contracts are reported under consideration (in apprehension of further rises in price) on the part of those who must have pipe soon. Prices have been marked up \$1 per ton with some reluctance, owing to the fear of cutting down business, but further advances may ensue. Quotations: 4-inch, \$30; 6-inch and upward, \$27; special lengths, \$1 extra. San Francisco—Prices have again advanced. Santa Barbara, Cal., has let

a small contract for 4 and 6 inch pipe, and small orders from private interests have been fairly numerous for the last fortnight, but there is nothing of special importance in the market. Quotations: 6-inch, \$38; 4-inch, \$41; class A, \$1 extra. New York—The predicted advance has taken place, and pipe is now \$5 per ton higher. The Warren Foundry & Machine Company has been awarded the contract for about 2,100 net tons of 6 to 36 inch pipe on which the city of Newark, N. J., opened bids Nov. 2. No public lettings of importance are announced, but plenty of private buyers are in the market for spring delivery. Quotations: 6-inch, class B and heavier, \$37.50; class A, \$38.50.

Lead.—Lead is inactive. Quotations: New York, 7.00 cents; St. Louis, 6.90 cents.

The Paving Brick Institute is to hold its forthcoming meeting December 5 and 6 at the Statler Hotel, Cleveland, O. The program announced is replete with valuable information in the operating departments of the industry. Men of prominence and authority are to discuss such subjects as "The Use of Powdered Coal," "Producer Gas in Burning Brick," "Equipment Efficiency," "Labor" and "The Development and Application of a Bonus System."

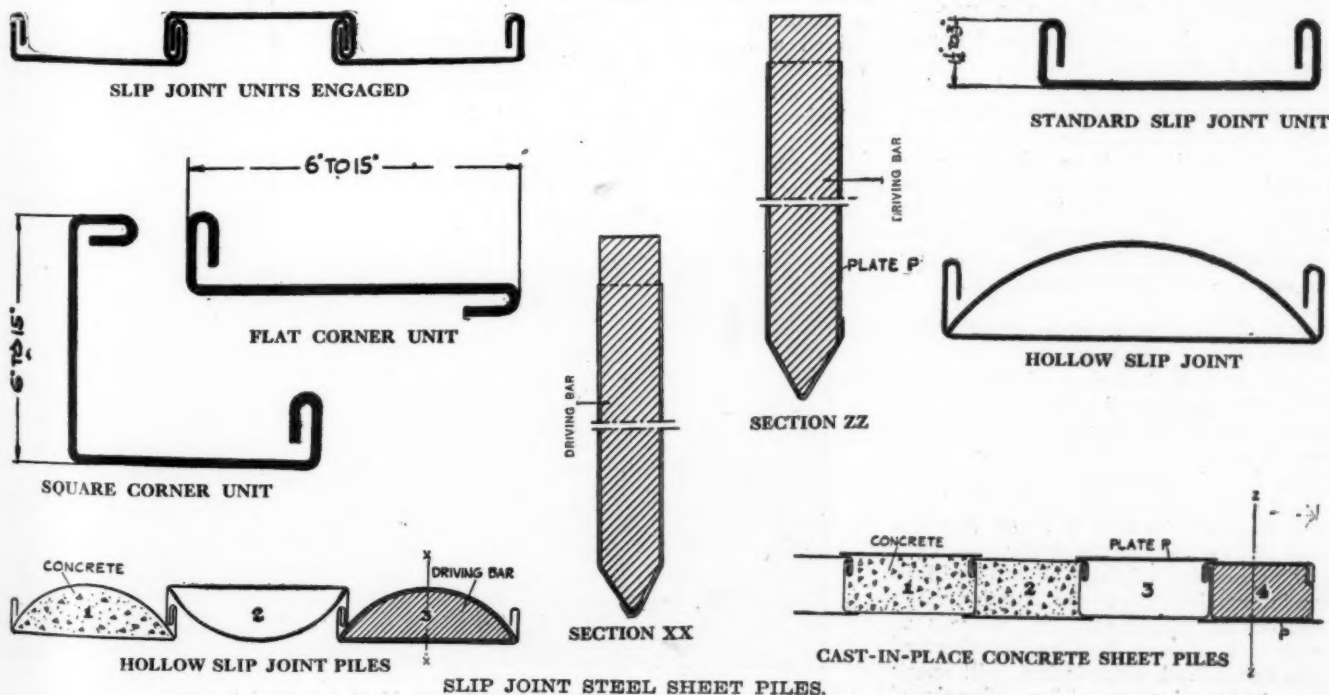
American-La France Fire Engine Company, Inc., Elmira, N. Y., announces the receipt of the following orders:

Duryea, Pa., Type 12 combination chemical engine and hose car with junior pump. Ephrata, Pa., Type 40 combination chemical engine and hose car with junior pump. Fulton, N. Y., Type 12 pumping engine. Frederickton, N. B., Type 40 combination chemical engine and hose car. Glendive, Mont., Type 12 combination chemical engine

and hose car with junior pump. Imperial, Calif., Type 12 combination chemical engine and hose car with junior pump. Jersey City, N. J., Type 31, 75 ft. aerial truck. Lethbridge, Alta., Type 12, pumping engine and hose car. Laconia, N. H., Type 75 pumping engine and hose car. Lakewood, Ohio, Type 75 pumping engine and hose car. Martinez, Calif., Type 40 combination with junior pump. Mason City, Iowa, Type 31, 75 ft. aerial truck. St. Cloud, Minn., Type 40 combination with junior pump. Watertown, N. Y., Type 12 combination with junior pump. Cornwells, Pa., Type D Brockway combination. Frostburg, Md., Type D Brockway combination. Falls City, Neb., Type C Brockway combination. Fulton, N. Y., Type B Brockway combination. Leamington, Ont., Type D Brockway combination.

Ingersoll-Rand Co., 11 Broadway, New York, N. Y., has issued for free distribution the following illustrated bulletins: Form 8311 on "Little David" pneumatic riveting hammers, inside trigger pattern. These hammers are offered in six sizes. A very important feature of this tool is the rivet set retainer designed to meet the regulations and requirements of the safety appliance laws enacted in the various states. Form 3130 on Class ER-1 power driven single stage straight line air compressors. Machines are built in various sizes from 6 to 12-inch stroke with a piston displacement capacity of 52 to 955 cu. ft. per minute and are equipped with the Ingersoll Rogler type of air valve.

The Federal Motor Truck Company, Detroit, Mich., announces the appointment of Lynn B. Dudley as advertising manager to succeed George W. Cushing, resigned. Mr. Dudley has had long newspaper editorial and advertising ex-



perience and for three years was connected with Campbell-Ewald Company, advertising agents. The company also announces that it is to bring out two new models to fill the increasing truck demand. The business of the company has doubled during the past year and the present rushing demand justifies anticipation of further increase so that new buildings are being constructed to increase production facilities.

NEWS OF THE SOCIETIES

(Continued from page 657.)

way to the country was responsible for the attendance of all save two of the entire board.

The members of the directorate attending were: Henry B. Joy, chairman of the board of directors of the Packard Motor Car Company; Carl G. Fisher, president of the Prest-O-Light Company and president of the Indianapolis Speedway, Indianapolis, Ind.; Roy D. Chapin, president, the Hudson Motor Car Company, Detroit; John N. Willys, president, the Willys-Overland Company, Toledo, O.; A. Y. Gowan, vice-president, the Lehigh Portland Cement Company, Chicago; Emory W. Clark, president, the First and Old Detroit National Bank, Detroit; F. A. Sieberling, president, the Goodyear Tire and Rubber Company, Akron; Paul H. Deming, vice-president, American State Bank, Detroit; S. D. Waldon, Detroit; H. C. Ostermann, field secretary, and A. F. Bement, secretary.

Russell A. Alger and Ex-Senator Beveridge of Indiana were the only directors unable to attend. S. D. Waldon and James A. Allison of Indianapolis were unanimously elected to the board of directors.

The old officers of the association were re-elected to continue through the coming year. They are: President, Henry B. Joy; vice-president, Roy D. Chapin; vice-president, Carl G. Fisher; treasurer, Emory W. Clark, and secretary, A. F. Bement.

Following the dispatch of routine business the field secretary and secretary reported upon the progress and present standing of the work of the association and plans were presented and adopted for greatly increased activities on the part of the association during the coming year, details of which will be made public in the near future.

Massachusetts Federation of Planning Boards.

Gov. McCall, in behalf of the Massachusetts homestead commission, has called the fourth annual conference of the Massachusetts federation of planning boards to meet at Springfield, Mass., November 23d and 24th. The meetings will be held in Hotel Worthy, and will be open to the public.

The evening of the 23d there will be an informal dinner at the Worthy, when mayor Stacy will give the address of welcome. Henry Sterling, secretary of the homestead commission, will speak on "Obstacles to City Planning;"

George B. Ford, consultant to the committee on city plan of New York city, will make an address; Cornelius A. Parker will talk on "The Legal Status of Districting in Massachusetts," and John Nolan and John P. Fox will give brief talks.

On the morning of the second day the visiting city planners from the 49 cities of the state represented in the federation will make a tour of inspection of the city. They will then assemble at the Worthy for the governor's address. This will be followed by a talk on "Building Lines and Assessment of Betterments," by Flavel Shurtleff, secretary of the National City Planning Conference. The discussion following will be led by mayor Harold M. Sweet of Attleboro and city solicitor Charles H. Beckwith of this city.

Luncheon will be held at the Highland Hotel, at which President Kenyon L. Butterfield of the Massachusetts Agricultural College will preside. The federation will then adjourn to Hotel Kimball to meet jointly at 2:30 p. m. with the National Municipal League. At this meeting the speakers will be George B. Ford of New York city; George E. Hooker, secretary of the Chicago City Club; J. Horace McFarland, president of the American Civic Association; Nelson P. Lewis of the Board of Estimate and Apportionment of New York City, and Robert H. Whitten, secretary of the New York Districting Commission. The annual business meeting of the federation at 5 p. m. will complete the sessions.

Oklahoma Municipal League.

The second annual convention of the Oklahoma Municipal League will be held in Oklahoma City on November 27 and 28, according to an announcement just made by John Alley, professor of government at the University of Oklahoma and permanent secretary of the league. Secretary Alley is also a major in the state militia. He obtained a furlough of fifteen days so that he could leave the border and meet with the executive committee in Oklahoma City to arrange for this year's program and meeting place.

Practically every problem that is confronting Oklahoma cities is to come up for discussion at the November elec-

tion, according to a tentative program made up by the executive committee at their meeting in Oklahoma City. This committee is composed of Mayor Val Mullen of Ardmore, president; Mayor C. A. Lamm of Bartlesville, vice-president; John Alley of the department of government of the University of Oklahoma, secretary; and Mayor J. A. Weiselogel of Pawhuska, Mayor J. E. Nissley of Guthrie, and Mike Donnelly, commissioner of accounting and finance, Oklahoma City, trustees.

The following tentative program has been announced for the first day's meeting at the council chamber, City Hall, Oklahoma City:

10:00 a. m.—Address of welcome, Mayor Ed Overholser, Oklahoma City. Response and president's address, Mayor Val Mullen, Ardmore. Report of secretary-treasurer. Report of standing committees.

1:30 p. m.—Auto ride, guests Chamber of Commerce.

2:30 p. m.—"The Municipal League," Mayor Frank P. Stearns, Shawnee. Roundtable discussion, on vice, and street paving and special assessments, leaders to be supplied.

7:30 p. m.—Music, male quartet, University of Oklahoma. Address, Mayor H. D. Lindsley, Dallas. Music, male quartet, University of Oklahoma.

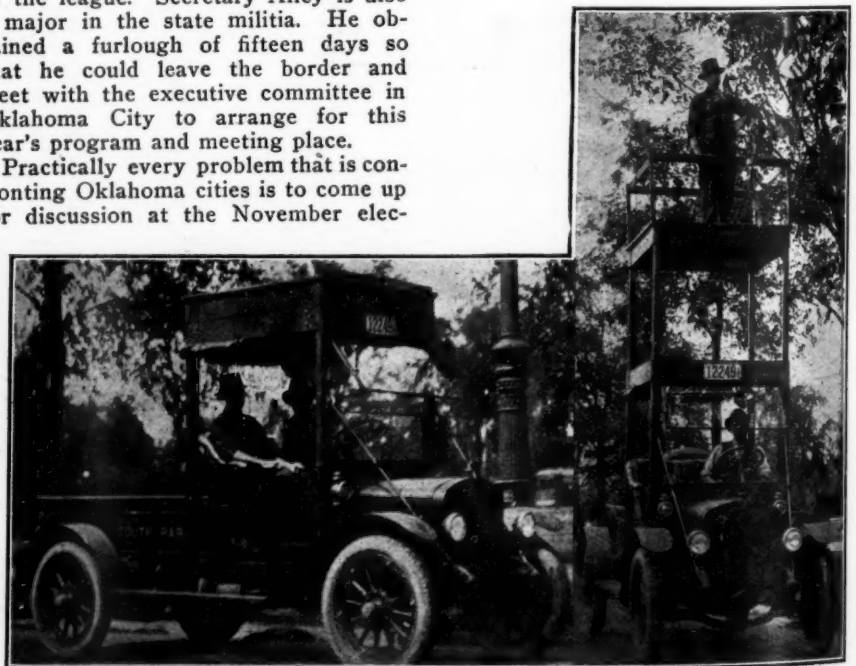
The second day's program is arranged as follows:

9:00 a. m.—Roundtable discussion of the following subjects: Parks, health, cemeteries, finance, waterworks, sewers, fire prevention, police regulations.

10:30 a. m.—Address, S. P. Freeling, attorney general.

2:00 p. m.—Address, Mayor Clint Graham, Marietta. Address, a representative from the University of Oklahoma.

5:00 p. m.—Election of officers and naming of next year's meeting place.



TWO VIEWS OF G. M. C. TOWER TRUCK.

ADVANCE CONTRACT NEWS

ADVANCE INFORMATION BIDS ASKED FOR

To be of value this matter must be printed in the number immediately following its receipt, which makes it impossible for us to verify it all. Our sources of information are believed to be reliable, but we cannot guarantee the correctness of all items. Parties in charge of proposed work are requested to send us information concerning it as early as possible; also correction of any errors discovered.

BIDS ASKED FOR

STATE	CITY	REC'D UNTIL	NATURE OF WORK	ADDRESS INQUIRIES TO
STREETS AND ROADS.				
Ore.	Eugene	11 a.m., Nov. 25	9,500 ft. road grading and bridging	S. M. Russell, County Clerk.
Ind.	Terre Haute	11 a.m., Nov. 25	Constructing gravel road	Thos. Ferguson, County Aud.
O.	Salem	Nov. 25	Widening Salem pike and bridge No. 1	County Clerk.
Fla.	Fort Pierce	Nov. 25	15,000 sq. yds. asphalt surface treatment	J. E. Fultz, Clerk, Co. Comrs.
Fla.	Miami	Nov. 25	Constructing 2.5 miles rock road	Z. T. Merritt, Co. Clerk.
Ind.	Terre Haute	11 a.m., Nov. 26	Road construction	Thos. Ferguson, Co. Aud.
Minn.	St. Paul	10.30 a.m., Nov. 27	Grading alleys	H. W. Austin, Pur. Agent.
La.	Mansfield	Nov. 27	20,000 sq. yds. asphaltic paving, gravelling streets, laying 16,000 ft. curb and gutter and 11,000 ft. of curb	E. C. Huson, City Clerk.
N. J.	Salem	Nov. 27	Constructing 25,000 sq. yds. pavement on Pennsgrove rd.	I. C. Smashey, Clk. Board of Freeholders
O.	Euclid	Nov. 27	Improving two streets; cost, \$15,000	F. A. Pease, Engr., Marshall Bldg., Cleveland, O.
O.	Euclid	noon, Nov. 27	Grading, draining, curbing and paving with brick, asphalt or asphaltic concrete	H. S. Dunlop, Village Clerk.
Ill.	Amboy	Nov. 27	10,000 sq. yds. brick paving, cement curb and gutter	City Clerk.
Wash.	Camas	7 p.m., Nov. 28	Paving with bitulithic or other pavement; cost, \$15,000	S. E. Farr, City Clerk.
N. J.	Riverside	8.30 p.m., Nov. 28	Grading Riverside ave., requiring 3,300 cu. yds. excavation	Lozier, Zabriskie & Van Keuren, Engrs., Bank Bldg., Hackensack.
O.	Steubenville	Nov. 29	Grading and pav. and constr. walks at filtration plant	G. W. Borden, Serv Dir.
Kansas	Kansas City	Nov. 29	Surfacing one mile of road; cost, \$6,000	County Commissioners.
Neb.	Falls City	1 p.m., Nov. 30	Street paving, cost \$5,000	Frank Smith, City Clerk.
Cal.	Fillmore	Dec. 1	Four miles cement curbs and sidewalks	E. M. Lynch, City Engineer, Glendale, Cal.
Fla.	St. Cloud	Dec. 1	11,000 sq. yds. hard-surface pavement with granite curb	W. A. Ginn, Engr. in charge
Tenn.	Memphis	Dec. 1	Constructing 10 miles of gravel road, estimated cost \$20,000	Board of Co. Supervisors
Fla.	DeLand	Dec. 1	31,653 sq. yds. paving, 38,592 lin. ft. granite or sand cement curb, and sand cement headers	G. A. Kreka, Bd. of Pub. Wks.
Neb.	Havelock	8 p.m., Dec. 1	Paving with vertical fiber brick, asphalt filler, curb, gutter and grading	Asher J. Blout, City Clerk.
Ind.	Greencastle	3 p.m., Dec. 4	Constructing gravel roads	J. M. Allen, Co. Aud.
Ind.	English	2 p.m., Dec. 4	Constructing stone road	J. B. Enlow, Co. Aud.
Ind.	Spencer	2 p.m., Dec. 4	Constructing stone road	S. M. Royer, Co. Aud.
Ind.	Connorsville	2 p.m., Dec. 4	Constructing gravel road	Glen Zell, Co. Aud.
O.	Lisbon	1 p.m., Dec. 4	Constructing 7 miles of 14-ft. brick pavement on concrete base	County Commissioners
Ala.	Dothan	Dec. 4	125-ft. steel bridge and 3 miles of turnpike	W. R. Koonce, Co. Engineer.
Ind.	Newport	10 a.m., Dec. 4	Constructing gravel road	Roy Slater, Co. Aud.
Ala.	Eutaw	Dec. 4	Construction section of state trunk road	W. S. Keller, State Highway Engr., Montgomery, Ala.
Minn.	St. Paul	10.30 a.m., Dec. 4	Grading a number of streets	H. W. Austin, Pur. Agent.
Ind.	Angola	1 p.m., Dec. 5	Constructing county road	F. C. Dewey, County Aud.
Ind.	Rensselaer	2 p.m., Dec. 5	Grading and constructing stone road	J. P. Hammond, Co. Aud.
Ind.	Kokomo	10 a.m., Dec. 5	Constructing stone road	W. L. Benson, Co. Aud.
Ind.	Monticello	10 a.m., Dec. 5	Constructing gravel road	A. G. Fisher, Co. Aud.
Ind.	Vincennes	2 p.m., Dec. 5	7,128 ft. gravel road construction	J. I. Muentzer, Co. Aud.
Cal.	Ventura	2.30 p.m., Dec. 5	5,300 sq. yds. Warrenite paving on bridges	J. B. McCloskey, Co. Clerk.
Cal.	Rockville	11 a.m., Dec. 5	Constructing 5 gravel roads	Charles Davis, Co. Aud.
Cal.	Santa Anna	2 p.m., Dec. 6	2.53 miles concrete pavement	Co. Surveyor.
Ind.	Shelbyville	10 a.m., Dec. 6	13,692 ft. gravel road construction	F. W. Fagel, Co. Aud.
Ind.	Warsaw	10 a.m., Dec. 6	6 miles of concrete road	Paul Sunny, Engr., County Court House.
N. J.	Elizabeth	2.30 p.m., Dec. 7	6,145 sq. yds. sheet asphalt, 3,237 sq. yds. granite block pavement and bluestone curbs and headers, about 7,000 feet	W. P. Neafsey, St. Comr.
Fla.	Miami	Dec. 14	Constr. causeway, incl. viaduct, 2 draw-bridges, retaining walls and fill; cost, \$600,000	Klyce & Kackley, Engrs.
Ala.	Grove Hill	Dec. 15	Improving roads; \$30,000 available	A. L. Smith, Co. Engineer.
S. C.	Greenville	Dec. 15	Street paving and sidewalks; \$130,000 available	W. F. B. Haynsworth, City Engineer.
Ill.	Berwyn	Dec. 16	Asphaltic concr. and mac. pav. and concrete curbing	Bd. of Local Improvements.
O.	Cleveland Heights (Warrensville P. O.)	Dec. 18	Grading, draining curbing and paving with brick, asphalt or macadam, several roads	F. A. Pease, Engineering Co., Marshall Bldg., Cleveland, O.
O.	Sidney	Jan. 1	Paving 6 miles of streets	T. Blake, Engineer.
N. J.	Keyport	Jan. 3	Warrenite paving on concrete base, cost \$65,000	G. D. Cooper, Co. Engr., Red Bank
La.	Independence	Jan. 10	Paving 31 blocks, cost \$100,000	City Clerk.
La.	Cedar Rapids	Feb. 1	Paving thirteen blocks; cost, \$90,000	T. F. McCauley, Engr.
SEWERAGE.				
Ky.	Louisville	Nov. 25	Concrete or segment block sewer, cost \$30,000	Roy Burks, Engr., City Hall.
Kansas	Pittsburg	Nov. 25	Constructing storm sewers, cost \$10,000	L. E. Curfman, City Engr.
Ill.	Arlington Heights	Nov. 25	Drain tile construction to cost \$75,000	Ewing & Allen, Engrs., 111 W. Munroe St., Chicago, Ill.
O.	West Park	noon, Nov. 27	Storm water outlet and sewer construction	F. Feuchter, Village Clerk.
N. J.	Glen Ridge	8 p.m., Nov. 27	8-in. pipe sewer construction	John A. Brown, Boro. Clerk.
N. Y.	L. I. City	11 a.m., Nov. 27	Constructing vitrified pipe, plain and reinforced concrete sewers, 6 to 78-inch	M. E. Connolly, Borough Pres.
Cal.	Berkeley	10 a.m., Nov. 27	Constructing storm water sewer	G. E. Gross, Clk. Bd. of County Supervisors.
O.	West Park	noon, Nov. 27	Constructing storm water sewers	Fred Feuchter, Village Clerk.
Minn.	St. Paul	10.30 a.m., Nov. 27	Constructing sanitary sewers	H. W. Austin, Pur. Agent.
Ill.	Chicago	Nov. 27	Sewers in several streets	M. J. Faherty, Pres. B. P. W.

BIDS ASKED FOR

STATE	CITY	REC'D UNTIL	NATURE OF WORK	ADDRESS INQUIRIES TO
Tex.	Lockhart	4 p.m., Nov. 28	Constructing complete sanitary sewer systems and disposal plant and a garbage incinerator.	H. E. Elrod, Engr., Interurban Bldg., Dallas, Tex.
D. C.	Washington	Nov. 28	8,200 ft. 54-in. sewer.	Dist. Comrs., District Bldg.
Pa.	Winton	Nov. 28	Constructing sanitary sewer system.	W. A. Taylor, Borough Engr., Olyphant, Pa.
N. J.	Palisades Park	8 p.m., Nov. 28	Constructing 15,000 feet of 8 to 12-inch pipe sewer, and 300 ft. 16 and 20-inch c. i. pipe sewer.	Lozier, Zabriskie & VanKeuren, Engrs., Palisades Park.
Minn.	Breckenridge	2 p.m., Nov. 28	Ditch construction to cost \$26,071.	P. E. Truax, Co. Aud.
Ill.	Chicago	Nov. 29	Constructing vertical shaft, centrifugal sewerage pump, direct connected to Corliss Engine.	W. R. Moorhouse, Comr. Public Works.
Ia.	Burlington	Nov. 29	Vitrified or concrete storm water and sanitary sewers.	C. E. Waterhouse, City Engr.
Fla.	St. Cloud	Nov. 30	Constr. sewer system and disp. plant; cost, \$21,500.	W. A. Ginn, Sanford, Fla.
N. Y.	L. I. City	11 a.m., Dec. 1	Constructing sewers in many streets and in sizes from 6 to 78 ins.	M. E. Connelly, Borough Pres.
Neb.	Havelock	8 p.m., Dec. 1	Constructing sewer lateral, consisting of 380 ft. 8-in. vitrified sewer pipe, one flush tank, etc.	Asher J. Blout, City Clerk.
Minn.	St. Paul	10:30 a.m., Dec. 4	Constructing a number of sewers.	H. W. Austin, Pur. Agent.
N. J.	West Orange	8:15 p.m., Dec. 5	Constructing 650 feet 12-inch sewer.	C. A. Winston, Town Engr.
Mont.	Bozeman	5 p.m., Dec. 7	Sanitary sewer construction.	C. A. Speith, City Clerk.
Minn.	Mankato	Dec. 11	Constructing sewers and water mains.	City Engineer.
Pa.	Erie	Dec. 19	Constructing Mill Creek improvements; estimated cost, \$850,000.	F. G. Lynch, City Engr.
La.	New Orleans	noon, Dec. 21	Constr. 3 12-ft. steel discharge pipes for drain. pumps.	G. E. Earl, Gen. Supt. Sewerage & Water Board.
WATER SUPPLY.				
S. C.	Charleston	noon, Nov. 25	Constructing receiving well and pump pit.	J. H. Bingle, City Engr.
Okla.	Stroud	Nov. 27	75,000-gal. elevated tank, 125 ft. high.	Benham Eng. Co., Oklahoma City, Okla.
O.	East Palestine	Nov. 27	Constructing power plant and water works station.	J. W. Smith, Clerk Board of Trustees.
Ill.	Wilmington	7 p.m., Nov. 27	750-ft. well and waterworks system; cost, \$34,000.	L. Momen, City Clerk.
Pa.	Philadelphia	10 a.m., Nov. 28	Storage tank at navy yard.	Navy Pay Office.
La.	New Orleans	noon, Nov. 29	Water and sewer construction.	G. E. Earl, Gen. Supt. Water & Sewerage Board.
Fla.	St. Cloud	Dec. 1	Constructing water works system and power plant.	W. A. Ginn, Engr. in charge
Okla.	Marlow	7 p.m., Dec. 4	Furnishing 250 h. p. engine, 180 k.v.a. generator, switch-board, motor and deep well pump and 19,000 feet 4-inch c. i. pipe, valves, gates, etc.	George Putty, Mayor.
N. J.	Ft. Hancock	Dec. 5	Repairing 50,000-gal. water tank and tower.	Quartermaster
Okla.	Okla. City	1:30 p.m., Dec. 5	Construction of water work system, including main dam and diversion dam, ditch bridges, well, conduit, etc.	C. L. Simmelbec, City Clerk.
N. J.	Bridgeton	8 p.m., Dec. 5	Constructing water works system, including 40 tons of 6-in., 67 tons 8-in., 123 tons 16-in., 31 tons 12-in., and 254 tons 14-in. c. i. water pipe; special castings, valve boxes, gate valves, fire hydrants; 11 tons pig-lead; and construction of reinforced concrete coagulation basin and gate chambers.	Comrs. of Pub. Wks. & Bldgs.
Pa.	Erie	Dec. 6	Furnishing 1,000,000-gal. low service pumping unit.	Chester & Fleming, Engrs., Pittsburgh, Pa.
O.	Cleveland	Dec. 6	Repairing filtered water reservoir at pumping station.	Edward Shattuck, Comr. of Purchases and Supplies
O.	Cleveland	Dec. 6	Relining clear water basin at filt. plant; cost, \$200,000.	Deputy Comr. of Water.
Minn.	Mankato	Dec. 11	Laying water and sewer pipe.	City Engineer.
O.	Lima	Dec. 12	Constructing water works. (See "Proposed Work")	A. L. Metheany, Serv. Dir.
Mich.	Detroit	2:30 p.m., Dec. 12	400 tons large special castings.	H. A. Gilmartin, Secy. Board of Water Comrs.
Ill.	Berwyn	Dec. 16	3 miles of 6-in. c. i. water mains.	Bd. of Local Improvements.
Man.	Winnipeg	noon, Dec. 18	Construction of 9.5 miles 5 ft. 6-in. reinforced concrete pressure pipe.	R. D. Waugh, Chief Com., 901 Boyd Bldg., Winnipeg, Can.
MISCELLANEOUS.				
Wis.	Milwaukee	10:30 a.m., Nov. 25	Extension to pier at Russell Ave.	Percy Brame, Deputy Comr. Public Work.
Mass.	Boston	noon, Nov. 27	Removing snow and ice in seven districts.	E. F. Murphy, Comr. of P. W.
D. C.	Washington	Nov. 27	Reinforced concr. seawall at Nav. Acad. at An'p'l's, Md.	Bureau of Yards & Docks, Navy Dept.
Mont.	St. Ignatius	2 p.m., Nov. 28	195,000 cu. yds. canal excavation.	U. S. Reclamation Service.
Tenn.	Dyersburg	Nov. 28	Constructing 8 miles of drainage ditches.	W. C. Kelly, Mgr., Union City, Tenn.
Mont.	Camas	2 p.m., Nov. 28	Canal construction, requiring 195,000 cu. yds. excavation.	U. S. Reclamation Service, St. Ignatius, Mont.
Pa.	Wilkes-Barre	noon, Dec. 1	Collecting and disposing of garbage and rubbish for 5, 7 or 10 years.	Fred Gates, City Clerk.
Ind.	Kokomo	2 p.m., Dec. 2	Constructing 2 drainage ditches.	Ellsworth Hunt, Construction Commissioner.
Ind.	Decatur	10 a.m., Dec. 2	Drain construction.	P. L. Macklin, Adams County Auditor.
Ind.	Fort Wayne	10 a.m., Dec. 2	Drainage ditch construction.	R. W. Guenther, Allen County Drainage Comrs.
O.	Columbus	noon, Dec. 4	Vehicle and dog license tags.	Geo. A. Borden, Pres. Board of Purchase.
Mo.	St. Louis	11 a.m., Dec. 4	Constructing 100,000 cu. yds. earthwork.	Secy. Mississippi River Commission, 1311 International Life Bldg.
D. C.	Washington	10 a.m., Dec. 5	Portland cement for navy yards at Puget Sound, Washington and Mare Island, Cal.	Bureau of Supplies & Accts., Navy Dept.
Ill.	Chicago	Dec. 15	Constructing rubble breakwater at Indiana Harbor, Ind.	U. S. Engr. Office, Fed. Bldg.
N. D.	Fargo	Dec. 16	Constructing drains, requiring 1,600,000 cu. yds. excav.	W. A. Tucker, Co. Aud.
Minn.	Duluth	1:30 p.m., Dec. 20	Ditch construction.	O. Halden, Co. Aud.

STREETS AND ROADS

Los Angeles, Cal.—Final ordinances adopted for improvement of 12th St. from Palos Verde St. to Gaffey St.; fixing and establishing curb lines on Springvale Drive from Eagle Rock Ave. to the west city boundary; fixing and establishing curb line on the northerly side of Railroad Ave. from Valley St. to Palm Ave.

Los Angeles, Cal.—Engineer instruct-

ed to prepare plans and ordinances for the improvement of First St., from Lake Shore Ave. to Virgil Ave.

Williams, Cal.—Four hundred more ft. of pavement is to be laid in the city.

Yuba City, Cal.—See "Sewerage"

Naugatuck, Conn.—Supt. of Streets was instructed to construct a cement gutter on Curtis St. adjacent to the present curb between Smith and Linden Sts.

Naugatuck, Conn.—The Supt. of Streets was instructed to lay curb on Prospect St. and to make necessary repairs to the sidewalk under the railroad bridge on Bridge St.

Naugatuck, Conn.—The Supt. of Streets was instructed to place gravel on Hillside Ave. from Grove to New St. A petition was signed by several residents in Millville for a fire hydrant was referred to the Fire Committee. A peti-

tion from property owners on Greenwood St. for sidewalk and curb was referred to the Street Committee.

Boulder, Colo.—Sioux City's plans and specifications for concrete street paving, which are giving much satisfaction, were adopted by the city council. Alderman Fitzpatrick thoroughly investigated methods of laying concrete paving, and the council has ordered City Engineer George Joslyn to change the detailed plans and specifications for paving 18 blocks in the business district, which are now being prepared to conform to the plan.

Tampa, Fla.—Petitions for paving of Maxwell Ave., between Madison and Twiggs St. to Seaboard Air Line referred to street committee.

Alma, Ga.—The following propositions, which were to be voted Nov. 7, has been postponed: Road, court house and jail bonds.

Joliet, Ill.—A combination brick and asphalt pavement for Marion street is provided for in a resolution approved by the board of local improvements. The brick will be laid between Bluff and Pleasant Sts. From Pleasant St. to Raynor Ave. a bituminous asphalt pavement will be laid. Public hearing was set for Dec. 4. The estimated cost, \$28,637.23.

Quincy, Ill.—Road bonds to amount of \$1,800,000 was defeated at the election held here.

Winnetka, Ill.—Engineers Winder and Marsh have completed specifications and plans for paving estimated to cost \$200,000. J. Merrillus.

Winnetka, Ill.—Village made plans for paving South East Dist. About \$200,000. Windes & Marsh, engineers.

Bloomington, Ind.—Bids received Dec. 1, 1916, at 2 p. m., by Treasurer of Monroe county, for sale \$4,800, \$16,000, \$5,750 and \$5,000 highway improvement bonds, 4½ per cent., ten years. Rolla Walker, Treasurer.

Frankfort, Ind.—Bids received Nov. 29, 1916, at 10 a. m., by Treasurer of Clinton county, for sale \$9,360 highway improvement bonds, 4½ per cent., ten years. Earl McDonald, Treasurer.

Huntington, Ind.—The board approved Lincoln Hoke's bond and contract for building a sidewalk on Lafontaine St.

Huntington, Ind.—Bid received Nov. 27, 1916, at 2 p. m., by Treasurer of Huntington County, for sale \$13,200 and \$8,600 highway improvement bonds, 4½ per cent., ten years. A. H. Shaffer, Treas.

Rockville, Ind.—Bids received Nov. 27, 1916, at 2 p. m., by treasurer of Parke county for sale \$3,685 and \$7,700 highway improvement bonds, 4½ per cent., 10 years. J. H. Rush, treasurer.

Vincennes, Ind.—Bids received Nov. 28, 1916, at 2 p. m., by Treasurer of Knox county, for sale, \$9,500 highway improvement bonds, 4 per cent., ten years. E. P. Blann, Treasurer.

Covington, Ky.—The following bonds were voted: Funding, \$140,000; street paving, \$380,000.

Lake Charles, La.—A petition is being circulated for concrete paving in Miller Ave. between Ryan and Hodges Sts. Bids will be asked by the commission council on several different types of paving on the streets.

Huntington, L. I.—Budget of the town highway superintendent, Edward Smith, which has been approved by the town board. For the repair and improvement of town highways, including sluices, culverts and bridges having a span of less than 5 ft., \$55,000, divided as follows: General repairs, \$6,000; oil, \$12,000; Park Ave., \$2,500; Deer Park Ave., \$1,500; Southdown Ave., \$2,000; New York Ave., at Huntington Station, \$5,000; repairs to permanently improved roads, \$20,000, and West Shore Rd., \$1,000.

Beverly, Mass.—Lay-out of May St. as a public highway was introduced by Alderman Irving and a hearing was ordered for Nov. 27.

Fitchburg, Mass.—Estimates of the cost of widening Main St. as proposed by the Municipal development commission, are to be secured from experts. The cost of the project has been variously estimated at from \$100,000 to \$250,000.

Springfield, Mass.—Upon the recommendation of the board of public works the following sidewalks were voted: Genesee, Crane, Bartlett, Margaret, Williams, Wilcox, Charles, Union and Howard Sts. and the following curbs were voted: Shattuck and Crane Sts.

Flint, Mich.—Nov. 7 election resulted in favor of \$100,000 road bonds. Fred A. Wertman, County Clerk.

Genesee, Mich.—Nov. 7 election: The \$1,000,000 bonding proposition for good roads carried by a majority.

Marshall, Mich.—Election resulted in favor of issuing \$800,000 road bonds.

Princeton, Minn.—Mille Lacs Co. will issue \$75,000 good road bonds. Address City Clerk.

Canton, Miss.—Road improvement bonds Madison county sold \$126,000. Address D. C. McCool, Canton, county clerk.

Ellisville, Miss.—Voted \$200,000 road bond issue.

Vicksburg, Miss.—Bd. of Supvrs. ordered bids be advertised for the repairing of the road lying between the National Cemetery bridge to the novaculite road.

Vicksburg, Miss.—Bonds for \$15,000 will be issued by the Bd. of Supvrs. for the purpose of completing the surveys of the roads. All surveys which have been started but not finished will be completed and carried to the county lines.

Kansas City, Mo.—Two bond issues will be presented to the voters with the proposed new charter at the special election in February. One to provide funds for the marking of the streets. The other as yet is the mayor's secret.

Garfield, N. J.—The ordinance to establish a grade, to grade, and to lay curbs and gutters on Schley St., passed first reading.

Hackettstown, N. J.—\$5,000 for street improvement voted by citizens.

Hackensack, N. J.—Bergen county freeholders will issue \$608,000 bonds for county road improvements.

Newton, N. J.—\$25,000 worth of road improvement bonds to pay Sussex County's share in the construction of the Sparta-Newton macadam road were sold on a bid of \$25,572.80 to Outwater & Wells of 16 Exchange Pl., Jersey City. Nine sealed bids from New York bankers were received by the Bd. of Freeholders.

Passaic, N. J.—Main Ave. from the Passaic City line to the Newark branch crossing at South Paterson is to be permanently improved by the board of freeholders and work on the improvement is to begin early in the spring.

South Orange, N. J.—Town plans to pave Wellesley St., macadam. E. R. Arcularius, Clerk.

Wallpack Centre, N. J.—For about \$10,000 town road commission contemplates constructing new road. Address Township Clerk.

Wallington, N. J.—State road department, Chairman Anderson, has made requisition upon the state for the following aid: In 1917, for \$1,500, to be used in repairing Lodi Rd. from 8th St. bridge to the Shortcut, and in 1918, \$1,000 to repair this street between the county bridge and 8th St. bridge.

Wallington, N. J.—The county has agreed to bear one half the cost of putting an asphalt pavement on Wallington Ave., between Lodi Ave. and the Passaic River. Will cost \$1,900. The clerk to have specifications prepared and advertise for bids.

Bennington, N. Y.—Proposition to issue road bonds \$7,500 was successful. Joseph F. Drilling, Town Clerk.

Brooklyn, N. Y.—In report of Chief Engineer Nelson P. Lewis of Board of Estimate and Apportionment, among the final authorizations are the following: Paving with asphalt Benson Ave., from 21st Ave. to 25th Ave., proposed contract time 40 days, cost \$31,600; also E. 10th St. from Foster Ave. to Avenue H, proposed contract time 30 days, \$6,100; also for paving with asphalt, 94th St., from 4th Ave. to Fort Hamilton Ave., 3 short blocks, to cost \$4,900, and Tapscott St., from E. New York Ave. to Sutter Ave., \$5,900.

Flushing, L. I. (N. Y.).—Among the final authorizations in report of Chief Engineer Nelson P. Lewis of Board of Estimate and Apportionment are the following: Borough of Queens for curbing and flagging 15th St., Flushing, from Beech St. to Sanford Ave.; proposed contract time, 20 days, cost \$2,300.

Herkimer, N. Y.—A petition was received from taxpayers of the town of Schuyler asking for the construction of shoulders for the protection of town road No. 26, was referred to a committee.

Jamaica, L. I. (N. Y.).—In report of Chief Engineer Nelson P. Lewis of the Board of Estimate and Apportionment the preliminary authorizations are as follows: Grading, curbing and flagging Yale Ave., Village, from Hillside Ave. to Canonbury road and grading the street at a width of thirty feet, centrally located,

and curbing from Canonbury rd. to Fulton St., two blocks, at a cost of \$3,800. Regulating and grading Canonbury road from Yale Ave. to Harvard Ave., one short block, \$1,000. Emerson St., from Freedom Ave. to Oxford St., one long block, \$3,300, and Newton road from Grand Ave. to 11th Ave., and for curbing, cost, \$900. Grading the sidewalk and gutter spaces and flagging Snedeker Ave., Woodhaven, on the easterly side of Jamaica Ave. to Rockaway Boulevard, and on the westerly side from Syosset St. to Rockaway Boulevard, nine blocks; \$5,000.

Le Roy, N. Y.—Town Supt. Campbell submitted his estimate of the amount of money which should be raised by tax for the coming year, which was approved as follows: Highway fund, for the repair and improvement of town highways, including sluices, culverts and bridges having a span less than 5 ft., \$3,850; bridge fund, for the repair and construction of bridges on the South St., Ferry, Roanoke and Creek road and general repair of all bridges having a span of 5 ft. or more, \$2,200, this item to cover the repair of damage to the Main St. bridge caused by the recent natural gas explosion and the replanking of the E. R. & P. overhead bridge on the Gilbert St. road.

Rochester, N. Y.—Local improvement first ordinances adopted were as follows: Molinari Terrace walks and grading, \$900; Brookdale Ave. grading, walks and sewer, \$12,000; Genesee Park Blvd. improvement, \$105,000; Genesee Park Blvd., \$100,000; Ethel St. asphalt improvement, \$4,300; Woodbine Ave. pavement, \$9,500; extension of Hinsdale St. from Culver road, \$10,000; Augustine St. outlet sewer, \$4,800; St. Paul St. widening, from Andrews St. along the east line of St. Paul St., \$7,500, and Orange St. asphalt pavement, \$24,000. Final ordinances adopted were as follows: Ohio St. grading, walks and sewer, \$11,500; widening of Wisconsin St. from Atlantic Ave. south, \$2,000; Kingsboro road extension, \$1,000; Keller St. grading, walls and sewer, \$6,600; Joseph Ave. widening from Norton St. to the Ridge road, \$2,000.

Rochester, N. Y.—An ordinance for the widening of Harwood St. was referred to the city planning commission.

Scotia, N. Y.—Village Clerk E. Crosby Hoyt has been notified by the State Highway Department that the plans for the improvement of the section of Sacandaga Rd. between Mohawk Ave. and the new county highway at Toll St. have been approved. These call for a 24-ft. roadway of concrete. The matter now goes to the Bd. of Supvrs. for further action.

Syracuse, N. Y.—The board approved the ordinance of the common council authorizing the commissioner of public works to construct concrete sidewalk corners without contract, the cost not to exceed \$300.

Syracuse, N. Y.—Ordinance adopted for paving of Whittier Ave. resurfacing Delaware, Gifford Streets, and Slocum Ave.; constructing a sewer in South Salina St.; paving Allen St., Euclid Ave. and College Place.

Wampsville, N. Y.—A communication from the state commission of highways showing that Madison county must contribute \$3,250 for the maintenance of state roads within its borders for the coming year. Sullivan, with a total mileage of 17.31, contributes \$850 of this amount; Lenox, 9.99 miles, \$500; Madison, 8.72 miles, \$450; Eaton, 7.68 miles, \$400; Nelson, 6.33 miles, \$300; Georgetown, 5.68 miles, \$300; Stockbridge, 3.90 miles, \$200; Cazenovia, 2.95 miles, \$150, and DeRuyter, 2.14 miles, \$100. There is a total of 64.70 miles in the county.

Yonkers, N. Y.—Directing the public works commissioner to make the necessary repairs to the surface of Tuckahoe Rd., between Central Ave. and the Bronx River. Approved.

Akron, O.—The election resulted in favor of issuing the following bonds: Elevated crossings, \$1,000,000; paving, \$350,000.

Bellaire, O.—\$30,000 for improving the roads in York township carried.

Bexley, O.—The Nov. 7 election resulted in favor of the following bonds: Street improvement, \$14,000; sewer, \$10,000. Chester A. Miller, Village Clerk.

Burton, O.—For paving East and West Park Ave., and two or three other streets of the village, carried.

Canton, O.—See "Sewerage."

Cincinnati, O.—State Highway Comr. Clinton Cowen submitted an estimate of \$164,620 as the cost of improving Hamilton pike, from Mt. Healthy to the But-

ler County line, with a brick pavement on concrete foundation, with concrete curbs; is part of the proposed Dixie Highway.

Delaware, O.—County road bonds in the sum of \$88,300 were sold to the Ohio National Bank, Columbus, at a premium of \$1,538.

Diamond, O.—Voted in favor of issuing \$16,500 road bonds.

Hamilton, O.—City Auditor Erb opened bids for the \$9,712.70 4½ per cent Washington St. improvement bonds and the First National Bank's bid of a premium of \$145 was the best.

Hamilton, O.—State Highway Commissioner Clinton Cowen, at Cincinnati, submitted an estimate of \$164,620 as the cost of improving Hamilton Pike, from Mt. Healthy to the Butler county line, with a brick pavement on concrete foundation, with concrete curbs.

Lebanon, O.—Street paving bonds approved, November election.

Novelty, O.—Nov. 7 election resulted in favor of issuing \$14,500 road improvement bonds.

Ravenna, O.—\$16,500 for road improvements in Palmyra carried.

Springfield, O.—\$10,000 for road improvements in Lewisburg township carried.

Upper Sandusky, O.—For paving streets in this city defeated.

Youngstown, O.—Repaving Oak Hill Ave. and widening and grading a number of streets including West Federal St. Estimated cost, \$225,000. Plans by Frank Lillis, City Engr.

Ardmore, Okla.—A company is being organized by Wirt Franklin, B. A. Simpson and others, with a capital stock of \$100,000, to build a toll road from Ardmore to the three oil fields in this county.

Holdenville, Okla.—\$30,000 road bonds voted by Calvin township. Address C. C. Clk.

Fossil, Ore.—Road bonds amounting to \$80,000 voted by citizens.

Beaver, Pa.—Beaver county commissioners to secure the early completion of the Monaca-Allequippa highway. The state department is shaping up matters for a conference in the near future. As soon as the legal requirements are met the department, it is understood, will at once advertise for bids for the completion.

Bradford, Pa.—Last election voted in favor of a loan for \$40,000 to be used for brick street paving. McKean county voted to bond the county \$750,000 for concrete and brick paving of country roads in the county. The State will pay a like amount.

Clifton Heights, Pa.—See "Sewerage." **Johantown, Pa.**—City council to widen the driveway at the intersections of Bedford, Ash and Hickory Sts., to relieve traffic congestion.

Mahanoy City, Pa.—Election was in favor of issuing street and fire department improvement bonds for \$70,000.

Monessen, Pa.—\$110,000 for borough improvements, most of which will be spent in paving, carried.

Mt. Penn, Pa.—The election resulted in favor of street improvement bonds for \$15,000.

Smethport, Pa.—Election held to issue \$750,000 road improvement bonds was successful.

Seranton, Pa.—Council plans to improve portion Pennsylvania Ave, asphalt. About \$33,922. W. Schunk, City Engr.

West Berwick, Pa.—Nov. 7 the citizens voted in favor of issuing \$50,000 street paving bonds.

York, Pa.—City plans to pave about 16,140 yd., pine blocks, next summer. C. F. Wallow, City Engr.

Murfreesboro, Tenn.—The following is a list of the counties that have issued bonds for the purpose of building roads in the State of Tennessee: Montgomery, \$100,000; Putnam, \$200,000; Franklin, \$350,000; White, \$90,000; Pickett, \$30,000; Van Buren, \$50,000; Dickson, \$230,000; Robertson, \$450,000; Humphreys, \$250,000; Davidson, \$300,000; Lawrence, \$350,000; Unicoi, \$150,000; Marion, \$100,000; Hamilton, \$250,000; Bradley, \$325,000; Rhea, \$250,000; McMinn, \$300,000; Monroe, \$625,000; Jefferson, \$475,000; Greene, \$800,000; Fentress, \$150,000; Grainger, \$200,000; Scott, \$300,000; Cumberland, \$100,000; Hawkins, \$500,000; Roane, \$250,000; Knox, \$500,000; Hamblen, \$375,000; Sullivan, \$600,000; Cocke, \$400,000; Carter, \$400,000; Washington, \$50,000; Sevier, \$150,000; Claiborne, \$365,000; Sequatchie, \$50,000; Campbell, \$250,000; Union, \$150,000; Blount, \$600,000; Polk, \$300,000; Meigs, \$100,000; An-

derson, \$300,000; Bledsoe, \$150,000; Morgan, \$250,000; Madison, \$500,000; Hardin, \$200,000; James, \$80,000; Hickman, \$225,000. Address County Clerk in County Seat.

Sherman, Tex.—W. G. Banks, City Clk. secured the Attorney General's approval to bond issues of the city aggregating \$250,000. Their sale netted a premium of \$6,400 divided as follows: Schools \$100,000, streets \$50,000, waterworks extensions and improvements \$30,000, electric light betterments \$10,000, fire alarm system \$10,000 and \$50,000 for sewers.

Ogden, Utah.—Boulevard on north side of the river, between Washington and Monroe Aves., were discussed. The commissioners decided to have city engineer prepare a map and plat for further consideration.

Portsmouth, Va.—Engr. R. B. Preston of Comm. of Roads and Bridges of Norfolk Co., in his report for the month of October, the following recommendations: Improvement of West Norfolk bridge road leading from Bower's Hill past Joliff's Church and School to the Hodges Ferry Rd. Ask permission to order an additional 10-ton roller and a scarifier.

Richmond, Va.—City Engineer Bolling to supply an estimate of the cost of grading sidewalks on both sides of Ashland St., from Lombardy to Meadow.

Richmond, Va.—Administrative board calls upon city engineer to prepare detailed plans for construction of a roadway from Byrd Park to Bryan Park, a distance of more than two miles.

Kingwood, W. Va.—By county commissioners, F. C. Everly, clerk, contract will probably be let in spring for 35 miles concrete paving in Portland district; estimated cost, \$280,000. J. C. Wonders, Engr., Terra Alta.

Landisburg, W. Va.—Fayette county making surveys for 34 miles roads. Address county clerk, Fayetteville.

Logan, W. Va.—Bid for street paving received Nov. 11 rejected; all types: 18,000 sq. yds.

Blaine, Wash.—E. E. Pruner, city clerk, reports council passed resolution providing for improvement of Washington Ave. et al. by constructing frame crossing on east side of Cedar Creek, etc.

Ellensburg, Wash.—For road and bridge work in 1917, county commissioners appropriated \$102,789. M. M. Emerson, Co. Engr.

Hoquiam, Wash.—The Grays Harbor Railway & Light Co. will call for bids for paving tracks between Riverside Ave. and Monty St.

Appleton, Wis.—Definite promises have been made residents of Sherman place that their street will be paved next year.

Ladysmith, Wis.—City plans to pave portion of Miner Ave. in spring. E. R. Kirvan, city clerk.

Milwaukee, Wis.—An ordinance to alter and permanently establish the grade on the alley in block 1, Sherman Park; alley block 3, Foster's subdivision; alley running northwesterly and southeasterly through block 26, Lake Side Park No. 4; alleys block 2; alley in block 19, Residence Park.

Sauk City, Wis.—The special election on the proposition to raise the sum of \$1,500 for street improvement in connection with county and state aid to be made from the end of the concrete to the village limits on Bryant St.

Petrolia, Ont.—The Town Council will construct cement sidewalks on Main St. Clerk, J. McHattie.

Ridgetown, Ont.—The town council will construct cement sidewalks on Church St. Town clerk, D. Cochrane.

BIDS RECEIVED AND CONTRACTS AWARDED.

(*Indicates Contracts Awarded.)

Gadsden, Ala.—Contract for two miles of road to connect Gadsden with the Big Wills and Little Wills valleys road let by the county highway commission to J. F. Morgan & Co. for \$10,000. The surface will be of chert.

Ft. Smith, Ark.—The contract for the paving and curbing of paving district No. 12 was let to *Cleveland Trinidad Paving Co. for \$12,499.

Daly City, Cal.—*Federal Construction Co., Sharon Building, San Francisco, secured contract for improving West End Homestead Dist., about \$135,858.

Fowler, Cal.—*Corfield & Davis of Bakersfield awarded contract to complete the paving of the state highway through Fowler; \$8,100. Other bids: The

Fowler Lumber Co. will furnish the cement at \$2.84 a bbl.

Ontario, Cal.—For curbing and paving with asphalt on 4-in. concrete foundation of various streets, *J. F. Miller, Santa Monica, about \$16,000.

Ventura, Cal.—Bids for street paving received Nov. 8 with concrete, 11.1 miles, 16 ft. wide, concrete foundation, 4 ins. thick, earth excavation, 28,000 cu. yds.: *Brashear-Burne Co., Los Angeles, \$2.12 per cu. yd.; excavation, 27 cts. per cu. yd.; total amount, \$39,349. J. B. McCloskey, County Clerk.

New London, Conn.—*J. Fowler, 181 Ocean Ave., secured contract let by State Highway Comm., about 30,000 sq. ft. concrete sidewalk.

Dixon, Ill.—For macadamizing the Roack Plank road in Nelson Twp., *Atkinson & Fiscal awarded contract.

Bloomfield, Ind.—Contract for repairing brick streets by Town Board was let to *John R. McGannon.

Columbia City, Ind.—*Elsee, Lehmer & Co., of North Manchester, contract for the construction of a gravel road in Northwest Whitley county, totaling \$37,653.60.

Indianapolis, Ind.—Board of public works let the following contracts: Cottage Ave., from Wright to Shelby, curb, *Henry Maag; 16th St., from Dearborn to Belt R. R., curb, *Lawson & Bruce; Cottage Ave., from Wright to Shelby, cement walks, *Henry Maag.

Lawrence, Mass.—*Goff & Wells Construction Co., Lawrence, secured contract for paving about \$30,000.

Revere, Mass.—For about 3,700 ft. tar macadam road in city of Revere, Commonwealth of Massachusetts, Wm. D. Sohler, Frank D. Kemp and Jas. W. Syman, 212 State House, Boston, Mass., let contract to *A. G. Tomascello, 69 Gibson St., Dorchester, Mass., at \$55,800.

Decatur, Miss.—Contract for grading Mississippi Travelers Highway, to *Floyd Loper, Lake, 2 miles, and *L. B. Dennis, Lawrence, 1 mile.

Holly Springs, Miss.—The Marshall County Commrs. have let contract to *R. A. Callahan, Potts camp, Miss., to construct 14 miles of road work, including bridges, culverts, etc. Walter G. Kirkpatrick, Engr., Birmingham, Ala.

Beatrice, Neb.—Contract for curbing, guttering and paving was awarded to *Abel Construction Co., Lincoln.

Garfield, N. J.—Contract for improving DeWitt St. awarded to *Salvatore Guardilbani, \$3,771.79. Following bidders: J. T. Harrop Co., \$4,562.24, and the Artificial Stone Co., \$5,130.91.

Ringling, Okla.—*John Thompson of Ringling, contractor, awarded the contract for building seven miles of highway in Earl township.

Erle, Pa.—*John McCormick & Son contract for paving Front St. from Myrtle to Chestnut Sts. and Chestnut St. south to Short St. by council; \$4,401.20.

Philadelphia, Pa.—Department of public work bids received Nov. 14 on work valued at approximately \$459,810. The estimated costs of the several characters of work are as indicated: Schedule "A" Grading, \$204,300; "B" Paving, asphalt, \$90,710; "C" Paving, vitrified block, \$21,000; "D" Paving, granite block, \$11,000; "E" Paving, bituminous macadam, \$2,500; "F" Surfacing, waterbound macadam, \$20,950; "G" Resurfacing, bituminous macadam, \$3,350; "H" repairing and painting bridges, \$56,000; "I" Improvement of Passyunk Ave., \$50,000. The bids are being scheduled and the low bidders will be known in few days.

South Brownsville, Pa.—Village let contract paving Prospect St., to Patrello Bros., about \$8,000.

Chattanooga, Tenn.—For constructing the Sequatchie Valley Pike, between Glendale Station and mouth of Suck Creek, 7-in. limestone macadam, was awarded by Hamilton Co. Rd. Comm. to *Bennett & Maloney Construction Co. at \$37,181.

Texarkana, Ark., Tex.—The *Burke Construction Co., of Fort Smith, contract to do the street paving in District No. 20, approximate cost of the entire work will be about \$160,000. The total number of blocks of street that will be paved about 58.

Richmond, Va.—Contract awarded to *John C. Weinbrunn for the paving of the first alley north of Park Ave., between Allen Ave. and Lombardy St. Weinbrunn's bid, \$914.

Pennsboro, W. Va.—For paving 1½ mile streets, *Winston & Co., American National Bank Bldg., Richmond, secured contract.

Wheeling, W. Va.—Contracts for con-

structing Bethany Pike, between Wellsburg and West Liberty, and Holliday's Cove road, between Steubenville bridge and Holliday's Cove, were awarded to C. E. Hamilton, Inc., Franklin, Pa., at \$162,000 and \$60,000.

Colfax, Wash.—Commissioners awarded extension of contract to G. L. Stickler on permanent highway No. 10 work to include 5,600 ft. new construction. Cost, \$6,800. John M. McCaw, County Engineer.

Kirkland, Wash.—Town Council awarded contract for construction of new water mains in North Kirkland to Geo. Rerick for \$2,244.50.

Mitchell, Ont.—Town council has awarded a contract for construction of cement sidewalks to John Avery, Mitchell.

Courville, Que.—Contract for road work to Emile Cote, St. Gregoire Village, Quebec county. Estimated cost, \$4,715.

SEWERAGE

Berkeley, Cal.—Ordinance approximating \$1,500 for construction of a combined storm and sanitary sewer from Vine St. and Shattuck Ave. to Rose and Walnut Sts.

San Diego, Cal.—Expects to advertise for bids for the construction of a \$40,000 extension to its sewer system about Dec. 1st. The work will include the laying of 26,212 ft. of 6-in., 1,642 ft. of 8-in., and 7,126 ft. of 10-in. pipe. Cement pipe will be used. Nearly all of the northeast portion of the city is included in the extension, which will be installed under the local improvement district plan. Plans and specifications are on file in the office of the city engineer, George Cromwell. Bids will be received by Allen H. Wright, City Clerk.

Yuba City, Cal.—A system of storm sewers and the paving of several streets is assured for Yuba City, Sutter county, bids having been asked.

Naugatuck, Conn.—The Warden was appointed agent to execute a lease on behalf of the boro. for the use of property of Mr. Langford in Union City for the construction of a storm sewer.

Sioux City, Ia.—The extension of city water service to North Riverside and the Milwaukee car shops and the construction of a sanitary sewer system in the suburb will cost \$40,000 or \$45,000, according to estimates made. Water mains will cost about \$25,000. Will be paid by the water works department. Cost of constructing a sewer system will be assessed to the property benefited. Improvements will be made early next year.

Louisville, Ky.—Bids will be received by the board of public works for reinforced concrete or segment block outlet sewer in Preston St., to cost \$30,000. Ray Burks, engineer, City Hall. Roger McGrath, Secy., City Hall, Nov. 25.

Beverly, Mass.—For the construction of a sewer on Sargent Ave., at an expense not to exceed \$500, was passed to a second reading.

Beverly, Mass.—Committee on finance will have a hearing Nov. 27 for the construction of a sewer on Pratt Ave.

Beverly, Mass.—For an appropriation of \$5,100 for the construction of a sewer on Fairview Ave. Recommended.

Bay City, Mich.—Council decided to go to the board of estimates with a request to borrow \$4,500 to complete certain sewers. Action was taken on the recommendation of the board of public works.

Flint, Mich.—West Side sewer, to cost about \$400,000; west end. Engineer, E. C. Shoecraft, City Hall, City of Flint. Plans in progress; 17,000 ft. reinforced concrete pipe.

Mankato, Minn.—City council decided to advertise for bids for the construction of a sanitary sewer and the laying of the water mains from Vine St. to Lime St. on North Front St.

Great Falls, Mont.—Construction of a sewer in Second alley southwest from Ninth to Tenth Sts. authorized by council.

Grand Island, Neb.—City plans extending sewer system. About \$250,000. H. W. Kibley, City Engr.

Randolph, Neb.—The \$5,000 sewer bonds were defeated by city.

Brooklyn, N. Y.—In report of Chief Engineer Nelson P. Lewis of the Board of Estimate and Apportionment, the following preliminary authorizations for sewers were given: Sewer in 68th St., from Fort Hamilton Ave. to 10th Ave., one long block, cost \$2,100; in Colonial Rd., from 76th St. to 77th St., \$800; in Newport St., from Amboy St. to Hopkin-

son Ave., one short block, \$600; in East 9th St., from Foster Ave. to Avenue H, \$2,100; in East 45th St., from Avenue M to Flatlands Ave., one long block, \$2,100; in 59th St., from 17th Ave. to 18th Ave., and in 18th Ave. from 59th St. to 60th St.; in Delamere place, from Avenue L to Avenue M, one long block, \$1,800.

Carthage, N. Y.—It was decided to have a comprehensive plan of the local sewer system made this winter by the state health board, so that in another year the board will be able to start on a plan for the sewage disposal.

Long Island City, L. I. (N. Y.).—In report of Chief Engineer Nelson P. Lewis, of the Board of Estimate and Apportionment, the preliminary authorizations for Queens were as follows: Sewer in Anable Ave., from Packard St., Long Island City, to Bliss St., and in Hughes St., Ridgewood, from Fresh Pond road to Sedgwick St., and in Sedgwick St. from Hughes to Sedgwick place, 400 feet of highway to cost \$1,300.

Lynbrook, L. I. N. Y.—The Civic Association is planning a campaign that may lead up to the installation of a municipal gas and electric plant and even sewers in the village. A conference was held at which William Graves, a Manhattan engineer, was present, and explained the situation.

Rochester, N. Y.—See "Streets and Roads."

Syracuse, N. Y.—See "Streets and Rds."

Syracuse, N. Y.—Ordinance directing Bd. of Contract to advertise for bids for construction of a sewer in Spencer and other streets was adopted. The cost, \$5,300.

Wilmington, N. C.—See "Water Supply."

Akron, O.—See "Water Supply."

Bexley, O.—See "Streets and Roads."

Canton, O.—For constructing west intercepting sewer, approved at November election.

Canton, O.—Nov. 7 election defeated the following bonds: West Intercepting sewer, \$106,000; East Intercepting sewer, \$104,000; South Market St. improvement, \$46,000; East Tuscarawas St. improvement, \$37,000; deficiency, \$200,000. S. E. Barr, City Auditor.

Hamilton, O.—The ordinance providing for construction of sanitary sewers in Lindenwald was given three readings. The service director will now advertise for bids and the actual work may soon begin. Sewers were also ordered on Progress Ave. and Huston St.

Lima, O.—Inquiry was started by the state health board to determine what action the city council would take to meet the ultimatum from the state requiring construction of a new sewer system for city.

Lima, O.—The Engr., Geo. W. Fuller, has prepared plans for sewer system for which \$500,000 in bonds have been authorized. Address Mayor Bartis Simpson.

Marion, O.—\$218,000 for trunk sewer defeated at Nov. 7 election.

Norwood, O.—City Engr. is preparing plans for the construction of a sewer in Station Ave.

Salem, O.—Assistant Engineer Adams of the state board of health has made an investigation of the sewerage disposal plant of this city and will advise Service Director Russell to make a number of improvements, one of which will probably be a recommendation that the sand in the plant be cleaned. A rough estimate of the most of this improvement, together with others contemplated, would involve an outlay of \$70,000.

Wapakoneta, O.—Sewer bonds defeated at November 7 election.

Worthington, O.—Council is in conference with Engineers Jennings, Lawrence & Lindsay of Columbus, who are making a report of the feasibility of sewers in this city. The approximate cost will be about \$120,000, which includes the necessary disposal plant and main trunk sewer line through the village.

Wapakoneta, O.—\$20,000 sewer bonds and \$7,000 deficiency bonds were defeated at Nov. 7 election.

Buffalo, Okla.—The elected resulted in favor of the following bonds: Water works, \$15,000; electric light, \$15,000; sewer system, \$25,000.

Cordell, Okla.—The city has issued bonds and will soon call for bids to construct system of main and lateral sewers. Plans and specifications being prepared by Benham Engineering Co., Engineers, Colcord Bldg., Oklahoma City. R. L. Harvey, Mayor.

Ponca, Okla.—See "Water Supply."

Beaver, Pa.—Sanitary sewer system, carried November election.

Butler, Pa.—A Committee was appointed to provide for sewer service in Shippan Ave., from Warren St. to Frederick St.

Clifton Heights, Pa.—Election resulted in favor of the following bonds: Sewer, highway and funding bonds, \$80,000.

Erie, Pa.—An ordinance for the construction of a 9-in. sanitary tile sewer in 27th St., extending from the center of Raspberry St. 500 ft.

Greensburg, Pa.—Sewerage disposal plant, carried at Nov. 7 election.

Lebanon, Pa.—Voted in favor of issuing storm sewer bonds, \$230,000.

Williamsport, Pa.—Council approved ordinances for sections of house sewers in Almond and Hepburn Sts.

Williamsport, Pa.—Bids for West 4th St., West St. and Government Pl. sewers were rejected.

Williamsport, Pa.—These ordinances providing for house sewers passed second and third readings unanimously: On Henrietta St., between East Third St. and the Seminary grounds; Brandon Pl., between Elizabeth St. and Courson alley; Brandon Pl., between St. Boniface and Franklin Sts.; Maynard, between First St. and a point 450 ft. south on First; alley north of Canal St., between Penn and Chatham Sts., between Taylor Pl. and Erie Ave., Walnut St. between Second and Third Sts.; Taylor Pl., between Lloyd and Oliver Sts., Almond St., between Washington and a point 32 ft. south of Hancock.

Frost, Tex.—Sewer bonds to amount of \$10,500 was approved by Attorney General.

Post City, Tex.—Post City Sanitarium Corporation plans sewer system. T. Herd, interested.

Sherman, Tex.—See "Streets and Roads."

Franklin, Va.—The following bonds voted: Water and sewerage, \$17,000; electric light plant, \$10,000.

Richmond, Va.—Engineer to advertise for bids for constructing a 15-in. and a 12-in. sewer pipe line in 4th St., from Maury to or near Stockton St., and for the construction of a sewer in Westwood Ave.

Everett, Wash.—Louis Lesh, city clerk, reports council passed resolution providing for construction of sewer in alley between Hoyt Ave. and Rucker Ave. from 21st St. to center of 19th St. Hans Mumm, Jr., City Engr.

Tacoma, Wash.—Sixth Ave. residents are pressing the public works department for a trunk sewer through school section No. 36, from N. 9th to N. 31st Sts.

Milwaukee, Wis.—The sewerage commission submitted a request to the council for the sale of \$560,000 in bonds, the balance of the issue of \$1,560,000, which was voted for the sewerage commission work this year. The commission wants the money by Dec. 20. Of this amount \$400,000 will be used in the construction of local sewers, most of it on the north side.

London, Ont.—The city council intends to construct a 10-in. tile sewer in Bathurst St. City Clerk, S. Baker. Estimated cost, \$2,209.61.

London, Ont.—The city council contemplates the construction of extensions to the storm and sanitary sewers. City Engineer H. A. Brazier.

Peterboro, Ont.—City council passed by-law authorizing the construction of sewers. Estimated cost, \$4,000. City Engineer R. H. Parsons.

St. Catharines, Ont.—At an early date City Engineer W. P. Near will have plans ready for a relief sewer in the east end and will report to city council.

Vancouver, B. C.—Vancouver and districts joint sewerage board will shortly award contract for construction of the large sewer in the west end of the city; about \$100,000.

BIDS RECEIVED AND CONTRACTS AWARDED.

(*Indicates Contracts Awarded.)

Gilroy, Cal.—Contract for constructing sewer system awarded *Contra Costa Construction Co., Berkeley, about \$40,000.

Los Angeles, Cal.—For constructing sewers in Florence Ave., main sewer district, *John Radich, at \$112,306.87.

Washington, D. C.—*W. F. Brenzinger Co., 141 Second St., N. W., secured contract for 5,500 lin. ft. masonry and pipe sewers, excavation, etc. Private plans.

Owner, Dist. of Columbia, O. P. Newman, L. Brownlaw, C. Kutz, Comm. D. E. Garges, Chief Clk. Engr. Dept. 427 District Bldg.

Cairo, Ill.—F. W. Keeler, Cape Girardeau, Mo., for improving Commercial Ave. sewer, \$20,192.

Parsons, Kans.—To J. M. Leeper, Topeka, city let contract storm sewer for insane asylum, \$5,000.

West Springfield, Mass.—Three bids for the construction of the Tatham sewer, which is to be 3,330 ft. in length, were rejected by the selectmen. Bids were as follows: L. C. Fay, of Springfield, \$19,174; D. O'Connell's Sons, of Holyoke, \$15,966; Cordner & Montague, of Springfield, \$14,539. The appropriation was \$7,000. The selectmen will not ask for any more bids, but will start on the work this fall, the operations being carried on under the direction of the selectmen.

Pontiac, Mich.—The city commissioners laid on the table for a week five bids on the work of making a complete survey and plans for the alteration of Pontiac's sewerage disposal system. The bids made by engineers make no estimates on the cost of installing a new system as demanded of the state health board, but agree on a tank system.

Duluth, Minn.—Eklund, Hedberg & Co., contract to lay a sanitary sewer in 101st Ave. west from the north line of Gary, First Division, to Reis St., \$355.

Sedalia, Mo.—For the erection of the new northwest Sedalia sewage disposal plant was let to J. W. Menefee, \$58,824.

Big Timber, Mont.—Gust. Nordquist, Great Falls, secured contract for sewers amounting to \$38,000.

Albany, N. Y.—John Doyle secured the following sewer contracts: In Hoffman Ave. and adjoining Sts., \$12,842.75; Delaware Ave. from Leonard Pl. north to Myrtle Ave., \$1,586.85; Schuyler St. from Green to South Pearl Sts., \$2,178.40.

Albany, N. Y.—George Holler, contract for sewer in Arch St. and Bway, at \$3,071.20; also contract across Slingerlands St. from Second Ave. to Catherine St., at \$395.

Niagara Falls, N. Y.—Bids for a sewer in Seneca Ave. from 24th St. to 240 ft. east of Sugar St. opened by City Manager Carr, will be reported to the City Council. Bidders: Tony Reynolds, Dominick Spacone, Reach & Ryan, and Nick Nolle.

Niagara Falls, N. Y.—Dominick Spacone for constructing a sewer in Seneca Ave. from 24th St. to a point about 420 feet east of Sugar St., at a figure of \$2,083.97. Engineer's estimate, \$2,670.

Troy, N. Y.—The board of contract and supply received bids for a sewer cleaning device. The Stewart Sewer Cleaning Machine Co. offered its product to the city for \$750. Was referred to the Mayor and Commissioner of Pub. Wks.

Youngstown, O.—Clyde C. Harris, La Cede and Oak Hill Ave., Youngstown, O., at \$10,258.90, for constructing sewers.

Donora, Pa.—For 2,000 ft. 8-in. terra cotta sewer contract let to J. W. Hall, at \$3,500; 3,000 ft. Engrs., Chaney & Armstrong, Borough Hall. Geo. W. Allen, Boro. Clk.

Philadelphia, Pa.—Ryan & Reilly, 32d St. and Gray Ferry road, at \$68,000, for constructing section of Frankford intercepting sewer in O St., from Lycoming St. to Kensington Ave.

Williamsport, Pa.—Contracts for the Court St. and Menne alley sewers were awarded to B. H. Coryell.

Texarkana, Ark., Tex.—A subcontract for building storm sewers in district 20 let to W. A. McTighe, a well known constructing engineer who moved to this city from Memphis.

Fond du Lac, Wis.—For sanitary sewers the following contracts awarded: W. Second and Emma Sts., Robt. Barnett, 389 Fourth St., Oak South, W. Division and W. Rees Sts., Frank Adams, J. F. Hohensee, City Clerk.

Sheboygan Falls, Wis.—The Mallmann-Martin Co. of Sheboygan Falls awarded contract for installation of sewer and water connections in those streets which are to be paved next year; \$3,200.

Toronto, Ont.—R. C. Harris, commissioner of works, for sewers at \$3,567, and to the Fussell-McReynolds Co., Ltd., 2014 St. Clair Ave., W., at \$37,250.

Toronto, Ont.—For the supply of one 12-in. Venturi meter for the main sewage pumping station, at \$1,239. Board of control awarded contract to the Builders' Iron Foundry, Providence, R. I.

WATER SUPPLY

Sunnyvale, Cal.—A special election will be held to vote \$30,000 bond issue water system, \$15,000, purchase of land for municipal buildings, \$4,000; completion of town hall, \$7,000; construction of a fire engine and hose house, etc., \$4,000.

Boulder, Colo.—Extending city water pipe line from the upper intake near Lakewood to a point above Caribou Creek, to the city's property near North Boulder, may be referred to the voters at municipal election in April.

Longmont, Colo.—City council considering \$80,000 water bonds.

Washington, D. C. (Bureau of Foreign and Domestic Commerce, Department of Commerce).—A Scandinavian business man who has been in the United States four years will shortly return to his native country. He desires to communicate with American manufacturers with a view to establishing sales agencies in Norway and Sweden for motors and motor vehicles, water pipes and pumps, steam boilers, armatures, steam engines, electric dynamos and specialties, and machinists' tools. References. Refer to Opportunity No. 23017.

Sioux City, Ia.—See "Sewerage."

Sylvan Grove, Kan.—For about \$20,000 city plans constructing water system.

Georgetown, Ky.—\$100,000 in bonds will be voted for municipal light and water system. Address Mayor.

Laurens, Ky.—The city voted \$250,000 bonds to extend the water works and improve them. Address R. C. Anderson, Engr.

Versailles, Ky.—\$20,000 for improving water supply carried Nov. 7 election.

Vinton, Ia.—City Council discussed construction of a municipal water works system to cost about \$20,000. T. H. Mandell of the city will prepare preliminary estimates.

Fitchburg, Mass.—Petition of the water commissioners for permission to lay a 4-in. pipe in the passway off Blossom St., opposite Pearl St., at an estimated expense of \$135, was granted.

Lenox, Mass.—Engineer Farnham's plan, which was indorsed by Engineer Goodnough and sanctioned by the public service commissioners, calls for the construction of a reservoir down the stream from the present Root reservoir, 7½ ft. lower in elevation, the reservoir to cover 9½ acres, to impound 52,000 gallons of water and to cost \$87,000, based upon approximate cost of labor at the present time.

Springfield, Mass.—The board of public works asked for \$7,000 to extend water mains to Swamp road and Barker Ave. The matter was referred to the finance committee.

Pontiac, Mich.—City may hold a special election in December to vote on a bonding proposition for the water works.

Duluth, Minn.—Manager Reed was authorized to advertise for bids on furnishing the water and light department with 2,200 tons of cast iron pipe for 1917.

Mankato, Minn.—See "Sewerage."

Winsted, Minn.—The city is considering the installation of water works system. Address John Salmon, Clerk.

Chillicothe, Mo.—R. W. Adins of the Missouri Inspection bureau made several recommendations for water supply: 6-in. pipe be adopted as a standard minimum size of water main used for hydrant supply. Hydrant to be given an overhauling, and gate valves be gradually installed.

Sedalia, Mo.—Steps were instituted by the city council for the erection of a municipal water plant to be built at a cost of probably \$300,000. Detailed plans for the work will be gotten under way as rapidly as possible. Address City Counselor R. S. Robertson.

Joliet, Mont.—City sold \$22,000 water works bonds.

Miles City, Mont.—Duplicate water main across Tongue River as a safety provision ordered by city council. Work will be started at once.

Norfolk, Neb.—The city will extend water system next spring. H. H. Alexander, City Clk.

Auburn, N. Y.—City at the general election this fall voted to install a slow sand filter at a cost of \$200,000. Plans and specifications have already been made by Hazen & Whipple. Bids will be asked for probably in January. J. Walter Ackerman, Chief Engr. & Supt.

Le Roy, N. Y.—Village Trustees have

arranged with Consulting Engineer Jas. R. Wells of Rochester, who had supervision of building the new water system, to make a preliminary survey for sewer system; also for a disposal plant with the necessary details and estimates of cost.

Lockport, N. Y.—Bd. of Supvrs: The Building Committee recommended that proposals be asked for the construction of a pipe line to carry city water to the site of the proposed tuberculosis hospital on the old almshouse farm west of the city. Such a supply of water is necessary before the State Dept. of Health will give approval of the site for hospital purposes. The pipe line would be about one mile long and would cost about \$10,000.

Michaville, N. Y.—Common council received petition requesting larger water mains on Viall Avenue.

Pine Plains, N. Y.—Common council committee will send the report of Myron Fuller on water supply proposition to Robert Horton, of Albany.

Rahway, N. Y.—Fire Chief Francis T. Hally in his report suggests \$500 appropriated by the city for care of hydrants be used in the ensuing year in testing and repairing the defective hydrants instead of painting them; also that fire and water committee place new hydrants on East Milton Ave., between Main and Lawrence St.

Watertown, N. Y.—A petition was received asking for a water main extension from Bradley St. 325 ft. into Lawrence Ave. to No. 74.

Yonkers, N. Y.—Public Works Commissioner Brady, recommending the construction of an 8-in. water main in Minerva Drive, from Laurel Court to St. George Parkway, a distance of 800 ft. Approved on ordinance.

Yonkers, N. Y.—The board approved the ordinance authorizing the installation of a new 3,000,000 gallon pump in the tube well station, eliminating the high service station.

Wilmington, N. C.—The purchase of the water and sewerage systems at Carolina Court at a cost of \$450 less about \$150 due by the owners of the suburb for sidewalks put down by the city was approved by council.

Akron, O.—The following bonds were defeated at Nov. 7 election: Water works improvement, \$300,000; sewer, \$515,000; drainage, \$135,000; viaducts, \$125,000.

Bucyrus, O.—Council has ordered a large number of water main extensions in the suburban sections, most of which specify 6-in. water pipe.

Columbus, O.—Plans are about completed for a lime kiln to be erected by the city and will be submitted to council in the near future. It is estimated plant will cost about \$30,000. The plant is to be used in connection with the filtration plant of the city water works.

Covington, O.—City officials lay out program for extensive improvements under new \$500,000 bond issue: Extension of Holman St. from its terminal on 11th to Robbins Ave., so as to connect with Greer Ave., making a continuous thoroughfare as far as Eighth St.; improvement of Madison pike, Lexington pike with granite blocks. Engineer Meiners to make survey of streets and avenues for improvements.

Lowellville, O.—Dec. 11 by J. F. Lash, Village Clk., water works bonds for \$25,000 will be sold.

Piqua, O.—For constructing stand pipe, installation of meters, etc., citizens defeated bond issue Nov. 7. J. M. Lloyd, City Clerk.

Wooster, O.—Water works bonds of \$20,000 have been authorized by vote. Address city auditor.

Buffalo, Okla.—See "Sewerage."

Mangum, Okla.—The mayor has called an election to vote bonds for a motor fire truck and for building a large reservoir for the water department. The reservoir is to cost \$15,000 and the truck and engine \$5,000.

Morrison, Okla.—City to cost \$18,000 considering construction of water works system.

Oklahoma, Okla.—Board of commissioners adopted plans and specifications for the new water works system. Commissioner Donnelly advertised for bids for the construction of the new plant.

Ponca, Okla.—An election resulted in favor of issuing water works, sewer and auditorium bonds; \$30,000.

Erie, Pa.—For the installation of a new 20,000,000-gal. high-pressure pump at the local water works station, Water Comrs. accepted plans of Engr. J. N.

Chester of Pittsburgh for a new pipe system around the pumping station. Practically the entire system must be reconstructed at a cost of more than \$10,000. Secretary Lensheimer will advertise for bids in December; also for a 20,000,000-gal. low service pump; cost about \$20,000, is planned for service between the station and the filter plant.

Topton, Pa.—Bond issue of \$23,000 for water works improvements and electric light plant, was defeated by citizens Nov. 7. Chas. H. Schlenger, Boro. Clk.

Seward, Pa.—For 50,000 gallon reservoir and about 2 miles of pipe line, plans being made. O. P. Thomas, Engr., Leader Bldg., Johnstown.

Noank, Ill.—A committee was appointed to investigate the expense of securing water system for the village.

Clover, S. C.—Town decided to vote Nov. 24, \$30,000 bonds for water works system.

Sherman, Tex.—See "Streets and Roads."

Franklin, Va.—See "Sewerage."

Olympia, Wash.—Water committee decided to construct water tower on West Side, capable of holding between 30,000 and 40,000 gals.

Olympia, Wash.—To provide added fire protection two water towers with a capacity of 40,000 gallons will be erected on the west side and east side; also 12-in. water main will be laid between pump on West Fourth St. to Brown Ave.

West Allis, Wis.—The city officials are planning to install a new water main and also considering the proposition of sinking wells and pumping part of the water supply from them.

Woodville, Wis.—The village board have plans and estimates toward a water works system.

Worland, Wyo.—City sold \$25,000 water works bonds. Denton Eng. Co. Engr., Worland.

Scarboro Twp., Ont.—Twp. will prepare plans for a water system. Twp. Clerk W. D. Annis.

BIDS RECEIVED AND CONTRACTS AWARDED.

(*Indicates Contracts Awarded.)

Claremont, Cal.—Contract for building reservoir for the Claremont Co-operative Water Company to *J. T. Ackland of Los Angeles. Specifications call for 20 tons of steel reinforced with concrete. The approximate cost will be \$5,850.

Pensacola, Fla.—A bid submitted for furnishing a truck for service in the water department, and tendered by J. D. Anderson, local agent for the Ford car, was accepted; will cost the city \$385.

Pontiac, Mich.—For an air compressor for the pumping station, the commission awarded contract to the *Worthington Pump & Machinery Corp., of New York City, who have agreed to furnish a 2,200 cu. ft. air compressor of the Laidlow-Dunn-Gordon Co. make for \$9,550.

Pontiac, Mich.—One hundred tons of class C cast iron pipe were purchased of the *United States Cast Iron Pipe & Foundry Co., of Chicago, which was the lowest bidder, who offered to furnish pipe for \$32.40 per ton. Crane & Co., of Detroit, quoted a price of \$33.40 per ton and the same figure was quoted by the James B. Clow & Sons, Chicago.

Duluth, Minn.—The following contracts for gas and water extensions were awarded: Laying mains in 6th Ave. east from 7th St. to the south line of Chamber's division, to *Riback & Farvi, \$558; in 98th Ave. west from House to Gary St., to *Eklund, Hedberg & Co., on their \$792, and in Victoria St. from 34th Ave. east to a point 41 ft. south of Victoria St., and in Wabasha St. from Kolstad Ave. to a point 125 ft. east, to *A. Hedenberg, \$953.

New Glasgow, N. S.—Contract for 2,400 ft. 12 and 16-in. pipe and 1,000 ft. 10-in. for gravity water system awarded as follows: Pipe laying to *Gammon & Weir, New Glasgow, and supplying pipe to *Canada Iron Foundries. E. S. Fraser, Town Engineer.

Cincinnati, O.—Service Director Hornberger let contract to *United States Cast Iron Pipe and Foundry Company to supply 150 tons of pipe for the water distribution system of the city; \$4,687.50.

Lisbon, O.—F. L. Stoffer, of Washingtonville, will probably be awarded the contract for the construction of a third water storage reservoir at the pumping station at Salem to cost \$17,000. The basin will have capacity of 1,200,000 gallons and will be built of reinforced concrete in the early spring.

Sandusky, O.—Upon recommendation of the city manager, the commission authorized immediate contracts for the purchase of 2,100 feet of 12-inch cast iron pipe and 3,000 feet of six inch pipe with the *American Cast Iron Pipe Co., of Columbus. The pipe will be used for water lines.

Coolidge, Tex.—Contract for constructing water works awarded *Dalton & Campbell, Dallas, at \$19,500. Henry E. Elrod, engineer, Dallas.

Norfolk, Va.—Preparation for the work of smooth paving Church St. was begun when the contract for installing the water mains, valves and hydrants on Church, Plume, 16½ and 28th Sts. and Loyall's lane and Llewellyn Ave. was awarded to *Louis Lawson, 12th and Moran Ave., the low bidder, for \$20,327.65.

Front Royal, Va.—*R. A. Figgett, Roanoke, Va., secured contract, at \$3,850, for filtration plant at Remount Depot, Front Royal.

Sheboygan Falls, Wis.—See "Sewerage."

MISCELLANEOUS.

Alameda, Cal.—F. P. Smith, representing the Consolidated Service Co., was before the city council and promised to pay the city \$53,000 for a 20-year franchise to collect the garbage; declares his company will establish a reduction plant on Bay Farm Island, where 200 men will be employed; refuse would be covered systematically with asphalt material which would convert it into a fertilizer; also that garbage will be collected by motor vehicles.

Hanford, Cal.—The Board of Supvrs. has agreed to purchase the necessary number of metal road signs to post Kings County properly. The matter was put before the board by G. S. Grant of the State Automobile Association. Association would pay for the metal signs that would replace the 300 or more wooden signs in the county, but that the supervisors would be asked to pay for the new signs that the association proposed to install.

Piedmont, Cal.—Bonds defeated at Nov. 7 election, \$13,500, for purchase of Dracena and Linda Parks; \$21,500 for the improvement and playground equipment of same; \$60,000 for the purchase and improvement of 10 acres in the lower section of Piedmont Park.

Sunnyvale, Cal.—See "Water Supply."

Washington, D. C. (Bureau of Foreign and Domestic Commerce, Department of Commerce).—A man, now in New York City, desires to purchase for shipment to Holland, liquid chlorine, calcium chloride, chloride of potassium, antimony sulphide. Terms cash at port of shipment. Refer to Opportunity No. 23009.

Washington, D. C. (Bureau of Foreign and Domestic Commerce, Department of Commerce).—An established firm in Argentina wishes to be placed in touch with American manufacturers and exporters of iron pipe, corrugated and plain galvanized sheets, plain zinc sheets, iron ingots, gasoline motors. Correspondence in Spanish. References. Refer to Opportunity No. 23008.

Washington, D. C. (Bureau of Foreign and Domestic Commerce, Department of Commerce).—A company in Chile is in the market for asphalt amounting to about 35 tons per month. Correspondence in Spanish. Refer to Opportunity No. 22992.

Washington, D. C.—See "Water Supply."

Daytona Beach, Fla.—Purchase of the T. H. Keating casino and ocean pier was discussed by council. An election will be called to vote on bonding the town for \$15,000; \$8,000 for the purchase and \$7,000 to repair the ocean pier and building.

Alma, Ga.—See "Streets & Roads."

Chicago, Ill.—Proposition to issue \$3,400,000 bathing beach bonds was defeated by citizens. Eugene R. Pike, City Controller.

Bay City, Mich.—Streets committee decided to purchase a General Motors combination flusher and sprinkler at \$5,500.

Benton Harbor, Mich.—Nov. 7 election citizens defeated the proposition to issue park bonds; \$18,000. Harry P. Smith, City Clerk.

Omaha, Neb.—Attorneys for Missouri Pacific Railroad and Omaha discussed with City Engineer Bruce and B. Koenig, secretary of the city planning commis-

sion, in regard to abolishing of the grade crossings. The railroad company has agreed upon the following: The bridges across Dodge, Douglas and Farnam Sts. to have solid concrete floors and cross beams between girders, and to have a clearance of 14 ft. under the center line of the railroad right-of-way, and all the necessary requirements.

Omaha, Neb.—City Council agrees upon track elevation improvement which the Missouri Pacific Co. intends to make along the Beet line at Dodge, Douglas and Farman Sts. The resolution will be presented to Judge Hook of the Federal Court at St. Louis.

Buffalo, N. Y.—Council will consider the plan of Millard Fillmore Bowen for the building of a sanitary drainage canal between Lake Erie and Lake Ontario. George Clinton, Sr., and Mr. Bowen have outlined to the council their proposition which, it is said, will solve the sewage problem without much expense to the city.

New York City, N. Y.—City has given the proposition, voted on election day, of issuing \$10,000,000 bonds for extensions of the forest reserve and the Palisades Interstate Park a big majority, which will carry the proposal through even if up-state goes against it, is the belief of the Conservation Commission in the face of scattering returns it has received from two sources.

Rochester, N. Y.—The annual ordinance for the removal of snow from the public sidewalks of the city for the season of 1916-17 was adopted. The cost, which will be done under the supervision of Comr. of Public Works Herbert W. Pierce, is estimated at \$90,000.

Rochester, N. Y.—The River and Harbor Committee adopted the ordinance for the purchase as a site for a municipal dock of a strip of land 1,680 ft. in length on the east side of the Genesee River, adjoining the new bridge at Stutson St.

Syracuse, N. Y.—Ordinance adopted by the Common Council for the enlargement of the channel of Furnace brook under May Ave. and a part of the Elmwood School lot was approved by the Board of Contract and Supply. Plans have been prepared by City Engineer H. C. Allen, with the view of preventing floods over private property during times of high water.

Syracuse, N. Y.—The sale at public auction by the department of public works of scrap iron, old brass and other metals and worn out equipment, including two wagons and an auto truck, was authorized by the adoption of an ordinance.

Akron, O.—See "Water Supply."

Akron, O.—See "Streets & Roads."

Canton, O.—See "Sewerage."

Delaware, O.—The First Natl. Bank of this city secured \$13,900 worth of ditch bonds at a premium of \$100.

Toledo, O.—Bids received Dec. 16, 12 noon, for purchase of \$605,000 bonds for the purpose of supplying a deficiency in the revenues of city.

Ponca, Okla.—See "Water Supply."

Clifton Heights, Pa.—See "Sewerage."

Johnstown, Pa.—Dr. L. W. Jones, city physician, in his next annual report will again recommend the adoption of a garbage collection system in the city.

New Castle, Pa.—Plans for building the Pymatuning dam to conserve water for the Shenango Valley and prevent floods, were discussed by the executive committee of the Conservation Association. It was reported that tests have been completed and that a good foundation has been found. Additional appropriations will be asked of the next legislature. The dam is to be located at the outlet of Pymatuning Swamp in Crawford County, the source of the Shenango River. F. W. Walker of Beaver Falls, president of the organization.

Weatherly, Pa.—Election was in favor of \$5,000 Eureka Park bonds. J. E. Rosenstock, Borough Secy.

Ballinger, Tex.—A garbage crematory plant will be erected by the city, bids for the building having been asked for. Plans have already been drawn.

Ballinger, Tex.—The city has disposed of its old fire truck and team of horses, securing \$450 for the equipment. Fund will be used in the purchase of a wagon and team to be used in permanent work on the business streets.

Corpus Christi, Tex.—A bill will be offered in legislature for construction of a seawall 600 ft. out in the bay from the present shore line and filling from shore

to the wall, wherein will be constructed a boulevard 300 ft. wide. The seawall will run the entire length of the corporate limits of the city.

Sherman, Tex.—See "Streets and Roads."

Wichita Falls, Tex.—\$15,000 bond issue for park and cemetery improvement passed.

Salt Lake City, Utah.—The residents of the southwestern part of the city discussed plans for parking the banks of the Jordan River between Fifth and Seventh South Sts.

Portsmouth, Va.—The public dock commissioners ordered \$20,000 of dock funds invested in short term 4 per cent city of Portland improvement bonds, which will be put on sale the latter part of the month. The bonds mature a year hence. Another sum of \$20,000 was set aside to meet bond interest due in a few weeks.

BIDS RECEIVED AND CONTRACTS AWARDED.

(*Indicates Contracts Awarded.)

Plymouth, Ind.—City Council has sold an issue of \$6,000 park bonds to the Meyer-Kiser Banking Co. at Indianapolis; \$300.50. The bid of other bond firms was as follows: J. F. Wild & Co., Indianapolis, \$251 premium; C. A. Reeve, Plymouth, \$285; Fletcher American National Bank, \$289.50.

Brooklyn, N. Y.—The Public Service Commission awarded *H. C. Stowe Construction Co. of 221 Greenpoint Ave., Brooklyn, at \$110,650.71, for the construction of 13 signal towers on the River Ave. and Jerome Ave. extension of the Lexington Ave. line, on the White Plains road line and on the Queensboro-subway.

Utica, N. Y.—*Baxter & Samoville se-

cured contract for collection of ashes at \$2,470 a month, for four years.

Cleveland, O.—Minnick-Gibbons Co. for the construction of a comfort station at the corner of Clark Ave. and W. 25th St., \$3,669. Also for comfort station at the corner of Euclid Ave. and E. 55th St., the cost amounting to approximately \$3,819.

Johnstown, Pa.—Contract was executed with the *Citizens' Light, Heat & Power Co. for the installation of the new police flashlight signal system. The contract with the Gamewell Co., which will furnish the equipment, has not yet been signed. A copy of it received here, however, reserves 180 working days for the installation of the equipment, so that the system will be in operation in the spring, at the latest.

New Toronto, Ont.—*Reed Products Co., Standard Building, Toronto, for the erection of an incinerator; \$10,000.

TOO LATE FOR CLASSIFICATION

BIDS ASKED FOR

STATE	CITY	REC'D UNTIL	NATURE OF WORK	ADDRESS INQUIRIES TO
STREETS AND ROADS.				
Cal.	Sacramento	11 a.m., Nov. 28	Improvements on several streets and alleys	City Engineer.
N. J.	Irvington	8 p.m., Nov. 29	11,270 sq. yds. bitulithic on 6-inch concrete foundation; 2,478 lin. ft. bluestone curbing, etc.	I. J. Casey, Jr., Town Engr.
Ind.	Angola	1 p.m., Dec. 5	Construction of county line road	Frank C. Dewey, Steuben Co. Aud.
Ind.	Delphi	Noon, Dec. 5	Construction of gravel, concrete or macadam road	H. D. Good, Carroll Co. Aud
Pa.	Plains	10 a.m., Dec. 8	Grading, paving and laying concrete sidewalks	Paxson & Morgan, Engrs., 2d Natl. Bank Bldg., Wilkes-Barre, Pa.
SEWERAGE.				
Cal.	Sacramento	11 a.m., Nov. 28	Sewer improvements on several streets	City Engineer.
Conn.	Waterbury	8 p.m., Nov. 28	Construction of sewers and appurtenances	R. A. Cairns, City Engr.
N. J.	Irvington	8 p.m., Nov. 29	Sewer connections	I. J. Casey, Jr., Town Engr.
Pa.	Plains	10 a.m., Dec. 8	Construction of storm sewers on a number of streets	Paxson & Morgan, Engrs., 2d Natl. Bank Bldg., Wilkes-Barre, Pa.
WATER SUPPLY.				
Ind.	Michigan City	Nov. 28	Furnishing and installing 2 water tube boilers at water works pumping station	Alexander Spychalski, City Clerk.
N. Dak.	Hankinson	Dec. 1	Water works system, power and tank	J. F. Druar, Engr., 312 Commercial Bldg., St. Paul, Minn.
Cal.	Whittier	7.30 p.m., Dec. 4	2,624 ft. 10-inch, 2,656 ft. 8-inch, 1,568 ft. 6-inch and 4,964 ft. 4-inch class B. c. i. pipe and fittings, including gate valves	Clarence O. Trueblood, City Clerk.
MISCELLANEOUS.				
D. C.	Washington	2 p.m., Nov. 27	Restoring street railroad tracks to grade	Chief Clerk, Engr. Dept. R. 427 District Bldg.
Ill.	Chicago	Dec. 2	Supplying natural cement to Bureau of Engineering for period ending Dec. 31, 1913	Dept. of Public Works.
Miss.	Gulfport	Dec. 4	Construction of drainage system, including pumping of sand, and construction of reinforced concrete, bridges and culverts	Harrison Co. Bd. of Supervisors.

STREETS AND ROADS

Pocatello, Ida.—At a meeting of the city council the contract for the sale of \$65,000 worth of district improvement bonds entered into several months ago with the Guarantee Trust Co. of Denver was cancelled. The city clerk was ordered to make a resale of the bonds to the Lumberman's Trust Co. of Portland, under the terms of their bid previously submitted.

Amboy, Ill.—For paving E. Main St. bids will be received during December. F. N. Vaughan, Mayor.

Riverside, Ill.—Paving Forest Ave. 3 blocks asphaltic concrete paving, concrete curb, plans completed. Bids received about January. C. N. Roberts, Engineer, 155 N. Clark St., Chicago; Wm. S. Burling, Village Pres., Riverside.

Nobleville, Ind.—Dec. 5, 1916, at 11 a. m., by Treasurer of Hamilton county, for sale \$820 highway improvement bonds, 4½ per cent. L. G. Heiny, Treasurer.

Hutchinson, Kan.—Estimates are being prepared to pave First Ave. Address L. S. Peques.

Independence, Kan.—An ordinance ordering sidewalk constructed in the city.

Haverhill, Mass.—Plans for the laying out of Fairfield St. were received from the city engineer and accepted. A hear-

ing on the proposition was ordered to be held Dec. 7.

Haverhill, Mass.—Petition for a concrete sidewalk on 14th Ave. was granted.

Nashville, Mich.—Village has under consideration improving Main St. Bonds to be voted upon Dec. 4th. An engineer to be selected after this date.

St. Louis, Mo.—Board of public service approved an ordinance for widening and repaving Olive St., from 14th St. to Channing Ave. The widening would be accomplished by adding 3 ft. on each side, taken from the sidewalk, thus increasing the width of the street from 36 to 42 ft. between curbs. The paving would be wood blocks, excepting between car tracks, at an estimated cost of \$96,000.

St. Louis, Mo.—An immediate effort will be made by city officials to complete King's highway from Easton Ave. to Penrose Ave. By change of the city's plans for the improvement of the highway and litigation the work has been held up ten years.

Newton, N. J.—For concrete road in Spring St., Sussex county voted \$12,000 bonds. Address Co. Clk., Newton.

Cincinnati, O.—State highway commissioner has submitted an estimate of the cost of improving Hamilton pike from Mt. Healthy to the Butler county line

with brick pavement on concrete foundation. His estimate is \$165,000. This contract will be awarded by the State Highway Commission early in January.

Elyria, O.—The city will construct macadam driveways in Cascade Park in the spring. About 2,000 sq. yds. to be used. Ready for bids in January or February. W. D. Taylor, 1900 Euclid Ave., is the landscape engineer.

Willoughby, O.—City plans to pave portion of Elm St., brick. C. Clerk, Engineer.

Wilmington, O.—The referendum in favor of paving of the streets of this city has been ratified by popular vote and arrangements for extensive paving program will be made.

Clearfield, Pa.—For paving various streets, brick, concrete base and gutters, brick manholes, castings, etc. Engr., E. W. Hess, A. E. Leitzinger, Supt. Highway Dept., will build and buy materials; \$50,000.

Brady, Tex.—For two roads on Puget Sound to Gulf Highway, in Melvin and Boca Dist., McCulloch county has made plans; about \$46,000. Address County Clerk, Brady.

Dallas, Tex.—Neely St. will be paved from Haines to Beckley with natural lake asphalt, Street Commissioner Lang recommending the granting of the improvement petition.